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TURES

ON

SUBJECTS

CONNECTED WITH

AL MEDICINE

BY

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PREFACE.

The Lectures contained in this volume are the first of a series which I am engaged in giving to the Students of St. Bartholomew's Hospital. It is, however, no part of my duty, as one of the physicians to St. Bartholomew's, to deliver lectures. The obligations of my office are limited to the wards of the Hospital; where my business is to attend the sick, and to aid the studies of those who seek the knowledge of disease at the bed-side of the patient.

But, since there are many things which must be first understood, in order that our inquiries at the bed-side may be pursued more profitably, I have thought that the practical student had a further claim upon me for any information I could afford him which might be necessary or conducive to his purpose. And thus I have been led to give occasional lectures "On Subjects connected with Clinical Medicine."

Considering the time of life at which the majority of those who are intended to practise physic begin their professional education, few can be supposed at once to understand the objects with which it is conversant. I have therefore endeavoured to put in as clear a light as I could, what is the nature of Facts and Opinions, and Theories and Principles, in medicine; and what concern the clinical student has with each; and how important it is for him rightly to distinguish between one and the other.

With respect to the mode of conducting his inquiries at the bed-side, I have suggested to him how to observe and what to observe; what demands his present attention and what may wait the season of his more mature experience; what books to read and what to abstain from reading; and the sort of knowledge which is principally auxiliary to clinical medicine.

But the subject to which I have chiefly desired to direct the student's attention is Semeiology, or the Doctrine of Symptoms; not for the sake of pointing out the symptoms of particular diseases, but of showing what symptoms are in their own nature; what sense, or rather what various senses, they bear; and what is their import and value in enabling us to judge of all diseases which are capable of being known and treated in the living man. For this purpose I have constructed no system, and have adopted only so much of arrangement as was necessary for the convenient discussion of the subject.

The Lectures, now published, embrace one part only of Semeiology. The inquiry, as far as it has gone, has been occupied with the evidence, which each organ is capable of furnishing, of its own diseases by symptoms directly referable to itself, and involved in the actual state of its sensations and functions and structure. This is the simplest and the easiest part of Semeiology.

Among such direct symptoms I have chiefly dwelt upon those by which Auscultation has enabled us to make discovery of diseases of the lungs.

Auscultation is capable, I have thought, of being greatly simplified for practical purposes. At all events, unless it be so, it can never be successfully taught; the knowledge derived from it must be confined to a few physicians of hospitals, and the profession at large can never expect much benefit from its use.

Whether I have succeeded in accomplishing what I think so desirable, and have cleared Auscultation of its mystery in any degree, others must judge. But thus much I can safely say, that the intelligent student, by attending to the few characteristic sounds which I have pointed out, and taking pains to understand their import, and guarding himself against over-refinement, is able in a few weeks to discern the leading truths connected with Auscultation, and in a few months to use it and trust it as his safest guide in the diagnosis of pulmonary diseases.

Such are the objects which these Lectures have in view. They do not pretend to teach the clinical student any single thing peremptorily or dogmatically, but only to furnish him with certain aids and assistances by which he may be better able to teach himself.

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ON
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I WISH to address a few observations to those of you especially, who, having passed through various preliminary studies in this great school of medicine, have now reached that department of instruction in which it is my lot to be engaged with you — viz., the clinical observation of disease, and the effects of remedies.

Your education is now at length concentrating itself to its great object: the time is arrived when you are to direct your minds expressly to the knowledge of diseases, and their treatment. All that you have hitherto learned in all the schools of instruction which you have ever frequented, you must bring with you, and make it ministerial to *this knowledge*. I talk not of science and philosophy *only* in those departments which bear immediately upon medical instruction, nor of science and philosophy *only* in any shape; but of every thing by which your intellectual and moral nature has been cultivated and improved at any period of your lives. Every good principle received from the counsel or example of parents in your earliest years — every laudable habit derived from fortunate association with good men — every maxim of prudence and virtue from good books — and, if there be a higher source (as I trust there is), to which some of you have looked for the proper motives, and ends, and hopes and destinies of man, and really know what they are — bring these, bring all that you possess, and engage them in active exercise, and link them to the great business of your lives; for now that business may be properly said to begin. It is that by which you are to live and take your station in the world — to do good, or to do evil — to gain friends or enemies, honour or dishonour; and in which the great accountable talent committed to your use will be well or ill employed.

There are certain stages in the progress of any great design, at which men are apt to pause and look back upon what has been accomplished hitherto, to see if there be any errors to correct, any omissions to supply; that thus every thing may be rightly ordered as they go along, and made fit and conducive to the chief end they have in view.

You are now arrived at such a stage in your professional education. Having gone through many preliminary studies, you have reached the most important of all — that for the sake of which all the rest were prescribed to you. And from this point you cannot help looking back; and you must look back with much or little satisfaction, according as, with much or little diligence, you have well or ill secured each preceding stage. The knowledge which lies behind is our natural help to that which lies before. Those, therefore, who have been diligent and learned much, I do indeed congratulate; for their further advancement will be easier and safer, and with a greater interest. But those who have been idle and learned little, I can only exhort to spare no pains in endeavouring to supply their deficiency; for, until they do so, the objects I am concerned to point out to them they must view with little interest, and will very darkly apprehend. Yet these objects are, above all others, important to them; for they are calculated to teach them practical knowledge and practical skill in the exercise of their profession.

But what is it, and how much is it, that a student ought to know, before he can betake himself with effect to the observation of real disease, and hope to acquire a practical skill in treating it?

This is a question which, I make no doubt, you have often asked, for your own sakes; since you are especially concerned that it should be satisfactorily resolved. And I, for my own sake, as well as yours, have often thought upon the same question; for I would not willingly mislead, by any rash answer or recommendation, those who, from the situation I hold in this place, might venture to trust to my advice.

There is no subject which at this time more needs the consideration of sober-thinking and reasonable men, than that of professional education.

The subject of education generally is one of great difficulty; yet, strange to say, it is one upon which any body thinks himself qualified to construct a system, and establish rules, and dictate to a whole community; not aware, perhaps, that the wisest men have exercised themselves upon the same, with very doubtful success.

Milton wrote a treatise on education, and so did Locke. And it was in reference to them that Dr. Johnson said, "Education in England has been in danger of being hurt by two of her greatest men."

Strange things have been said in jest, or in earnest, concerning the studies necessary to form a physician. Sydenham advised Sir Richard Blackmore to read Don Quixote. He probably spoke in jest. But it is impossible to read Sydenham and not perceive that his mind did in truth hardly admit any auxiliary to the exercise of its own observation. What he says of anatomy must startle the pains-taking pathologist of modern times, who bestows all his industry in tracing diseases home to the primitive structure in which they are engendered. Anatomy, he has told us, is only fit for a painter. Sydenham might have been *professionally* learned; but there is no evidence in his works that he was so. Perhaps he was offended with the kind of learning then in repute, which tended to make the practice of physic rest chiefly upon authority; or, perhaps, the very structure of his mind was such, that it was really incapable of gaining any thing second-hand which it could gather fresh from the reality; or perhaps he had a noble confidence in that wonderful faculty of observation with which he was endowed, and so resolved to use and to trust it to the uttermost, unaided and unencumbered by any foreign helps.

But Sydenham's education, in so far as it was not professional, was evidently of the best kind. His mind had been early acquainted with a strict, indeed with a scholastic discipline. His book is that of a scholar; I do not mean on account of the language in which it is written, but in its form and structure. Without any apparent artifice, the material facts, and delineations, and histories, arange themselves all in the right places for being well understood; and they are all so skilfully reasoned upon as to lead you easily and naturally to the conclusions he desired.

Are we then justified, not by the advice of Sydenham, which was probably spoken in jest, but by his example, in concluding that nothing more is required, to fit a man for the safe and successful practice of physic, than a good *general* education, and an industrious use of his own observation in his intercourse with the sick? I think not; and, among many other reasons, especially for the two following: — First, Because you cannot tax the faculty of observation beyond its *common* powers and capacities; you cannot estimate it in the generality by what it was in Sydenham, and look to it for the same results. This would be the same thing as to take measure of all mankind by the proportions of a giant, and make the single wonder of a hundred years the common expectation of every day.

Secondly, Supposing the faculty of observation existed in each of us at its utmost perfection, and enabled each to learn by it all that it is in its own nature capable of teaching; yet there are objects beyond its reach, the knowledge of which has, in the progress of our art, come to be considered as essential to the safe and successful practice of physic as those which lie strictly within its sphere; I mean the knowledge of morbid processes in all their variety, as they affect the structure and functions of our bodies. This knowledge has been derived from other methods of research, from anatomy, from chemistry, from experiment; and you can only gain it either by the use of such methods yourselves, or from the instruction of those who have used them. Sydenham himself could gain it in no other way.

But, in our own day, there is little fear that students will be spoiled by the recommendation of their instructors to be content with a scanty knowledge, and trust to their own sagacity for the rest. They are not likely to suffer harm by having Sydenham held up as an example for imitation: the fear is of another kind (and it is well grounded), namely, that many men of the best abilities and good education will be deterred from prosecuting physic as a profession, in consequence of the necessity indiscriminately laid upon all for impossible attainments, of which no example either is or can be held forth for their imitation.

The different professions have one way of glorifying themselves, which is common to all. It is by setting forth a vast array of preparatory studies, and pretending they are indispensable in order to fit a man for the simple exercise of the practical duties that belong to them. I have heard lawyers make such a mighty parade of the things which a man must know before he is called to the bar, that, according to the average of human capacities, not one in fifty has the smallest chance of mastering them; and of those who do master them, not one in fifty can employ them to the uses for which they are intended.

I once saw a list of books recommended by a professor of divinity to the study of those going into holy orders. They were more numerous than the majority of even studious men ever read in their whole lives; yet these were a few prolegomena introductory to the office of a parish priest.

We, too, conceive that it befits our dignity to magnify ourselves at certain seasons. The commencement of a session is usually the time chosen; and then, what a crowd of wonderful things are marshalled by authority around the entrance of our profession! And through this crowd, it is implied, every man must press his way before he can gain admission. As if we wished to guard and garrison ourselves against invaders, rather than to gain good and useful confederates! In the affair of literature are reckoned Latin, and Greek, and French, and Italian, and German. In the affair of science, mathematics, and metaphysics, and mechanics, and optics, and hydraulics, and pneumatics, mineralogy, botany, zoology, and geology.

Such are the portentous forms that guard the threshold. But further onward are placed anatomy, human and comparative, and morbid; physiology and pathology; chemistry, general and pharmaceutical, and materia medica; surgery, theoretical, clinical, operative, and opthalmical; medicine, theoretical, clinical, obstetrical, and forensical.

The general display of objects so grand and multifarious is formidable enough; but not half so formidable as their representation in detail. Of the great cosmogony of medicine there are several departments, and each professor never fails to magnify his own, by counting the cost of time and labour, which you must be prepared to bestow if you wish to make any reasonable progress in it. "Haller (perhaps such an one will say) surely knew what anatomy is, and how much goes to make an anatomist; and Haller has estimated the cost at twenty years of time and labour."

Now I am persuaded that there does not exist at this day in the profession an individual who comes up to the standard which (it is implied) all ought to reach. It has been my happiness to know many men in my time who have had enough of attainment to command my highest respect; some who have reached great eminence during their lives, and some who have been thought worthy of monuments since their deaths*; yet I have known one, and one only, who came up to the requirements of an introductory lecture, which I have read; and that was Dr. Thomas Young. But Dr. Young stood alone among mankind. The most learned and scientific men of his time were struck with wonder at the extent and variety of his knowledge; yet Dr. Young was the only person whom any man now alive ever saw learned and scientific enough for a physician, according to the Utopian measure of things.

If all medical students had fifteen or twenty years at their disposal, and could dedicate them all to professional education, we might pardon a little innocent declamation in displaying the rich and varied field of knowledge about to be disclosed to them; but even then, sober truth would compel us to confess that the field so pompously displayed far exceeded in extent what the best minds could hope to compass, even in fifteen or twenty years. When, however, we recollect what space of time the majority of men so addressed really can give to their education, the whole affair becomes inexpressibly ludicrous.

Now I do protest, in the name of common sense, against all such proceeding as this. It is all very fine to insist that the eye cannot be understood without a knowledge of optics, nor the circulation without hydraulics, nor the bones and the muscles without mechanics: that metaphysics may have their use in leading us through the intricate functions of the nervous system, and the mysterious connection of mind and matter. It is a truth; and it is a truth also that the whole circle of the sciences is required to comprehend a single particle of matter: but the most solemn truth of all is, *that the life of man is threescore years and ten.*

How has it happened that while, in other countries, the medical profession has been exhibited under every imaginable form of ridicule, here, in England, it has been so seldom chosen as a fit thing to laugh at? The truth is, tha. here no idea of ridicule was ever popularly associated with it; and to have exhibited it as if there were, would have been out of nature and unsuccessful.

A vain, pompous, counterfeit form of knowledge without, and a downright solid ignorance and incapacity within, made up a precious combination, which, not along ago, was found every where abroad. The mockery and fun that it excited were irresistible and inexhaustible; and Molière and Le Sage made the world ring with laughter at the expense of physic and physicians.

Depend upon it, what all men indiscriminately are told they *ought* to know, all men indiscriminately will soon *pretend* to know, be it never so extravagant; and when every medical man in every town and village throughout England, be he physician, surgeon, or apothecary, shall, in right of his profession, claim the homage due to vast learning and science, there will not be wanting some Molière or Le Sage to hold us all up to the just ridicule of mankind.

Let us take care then what we are about, and beware how we change the character of the English practitioner of physic. He is sound and unpretending, and full of good sense; what he wants is a little more careful and a somewhat larger instruction in what bears directly upon the practical part of his profession. Give it him (indeed we *are* giving it him), and he will become more trust-worthy and more respected every day. But for all that is beyond this, we may recommend it, but we must not insist upon it; we must leave it for each man to pursue according to his leisure, his opportunities, and his capacity, and not exaggerate it into a matter of necessity for all. Where too much is exacted, too little will be learned; excess on the one hand naturally leads to defect on the other.

I know that much disquietude, if not unhappiness, has been felt by students, and especially by the best informed and best disposed, when, at the entrance of their profession, they have been met by obstacles which seem insurmountable. It is the special infirmity of ingenuous minds to reflect with too much anxiety upon their own progress in knowledge; to sit in judgment upon themselves, calculating whether they have made the best of all their opportunities, and wishing, vainly wishing, that their time might come over again, to enable them to supply this omission, or rectify that mistake. By many such, who are at all times too ready to deal hardly with themselves, every exaggerated statement of what they are required to learn is severely felt.

A well-weighed scheme of professional education, sound and practicable, comprehensive yet moderate in its requirements, and adapted to all, besides the many good purposes it would serve, would have the special benefit of satisfying the minds of students themselves that at each step of their progress they are in the right path. Such a scheme we are not likely to have soon. I will not presume to suggest what it ought to be; I would rather endeavour to show you, that, in spite of what you are perhaps at present inclined to fear, you may hope to earn a good reputation, to deserve and gain the approbation of mankind as others have deserved and gained it, although you do not possess a perfect literary and philosophical education.

Turn away, then, from the contemplation of this ideal perfection, which can only make you despair, and look to some real examples for your encouragement. But take care that they be *high* examples, and such as no small or ignoble efforts can imitate. I could choose them from among living men. For there are living men who would satisfy my own notion of what a physician ought to be. But I prefer to look for them among those that are gone, because there can then be neither offence nor envy in the selection. They shall, however, be such as are fresh in the memory of contemporaries, that I may have witnesses to the truth of what I say.

I will take Dr. Baillie and Dr. Babington; and I am content that the *general* estimate of the physician's character should be measured by what mankind at large thought of these two. Their intercourse with the world was large; and it is more than probable that a great portion of the best informed men in their time did, in point of fact, form their notion of what a physician ought to be, from what Dr. Baillie and Dr. Babington actually were. I am content, also, that the *professional* estimate of the physician's character should be taken at the worth in which medical men held them.

Perhaps no men that ever lived were better understood, not merely in the general outline of their characters, but in all that nature, or erudition, or experience, or habit, or fortune, had made them, than were these two eminent physicians. They had both been public instructors in the lecture-room, and in large hospitals, and both had immense private practice. Of those who are now exercising their profession in the maturity of their age and experience, many were their pupils; and almost all the medical men of London have met them in consultation.

Now the reputation of Dr. Baillie and Dr. Babington would not be exalted by any lavish praise of them for qualities which they did not possess.

They do not need our commendation for what they were not. Enough will still remain to make us content to be what they were, although it should be denied that either of them was remarkable for the extent or variety of his acquirements. We may still take them as our examples, although neither of them did, or ever pretended to, possess a knowledge of one half the things now recommended to the medical student as indispensable. In truth, those who knew them best, and admired them most, will not say that their admiration of either was called forth by the many things they understood beyond all other well-educated physicians.

Dr. Baillie was an anatomist, and Dr. Babington a chemist. And thus each had chosen well a department of knowledge on which their minds seemed most capable of being exercised with a happy result. The minds of both had their natural bent towards matter of fact; and the favourite pursuit of each served, by its very use and exercise, to perfect their understandings according to the mould in which they were originally cast.

The one taught anatomy, the other chemistry, with great reputation and success; and both were deeply and experimentally versed in what they taught. But neither was anatomy, in the hands of Dr. Baillie, nor chemistry, in the hands of Dr. Babington, made subservient to any great purposes of physiological or pathological discovery. Yet doubtless they *are* capable of such purposes, and to such they have been made to contribute by others. But education contemplates the ordinary fruits of knowledge. What is new exceeds its calculation. Men are not educated for discoverers; these stand alone; for they become what they are, beyond, and often in spite of, their education. They can never be quoted as examples.

But the fruit of their knowledge to the two eminent men in question was nothing more than the ordinary fruit; and, therefore, I chose them as examples. It was the ordinary fruit, but its measure was large. Their knowledge of anatomy and chemistry served them for all the purposes to which they are immediately applicable in the daily exercise of their profession; and, being in harmony with the natural bent of their minds, it still kept them striving after accuracy in all their investigations, and confirmed them in the habit and skill of appreciating the truth.

I am far from saying that in anatomy and chemistry consisted all the scientific knowledge they possessed, subservient to the uses of their profession. Herein, however, consisted the strength of their knowledge; and, for the rest, they were well-educated gentlemen. But I will venture to affirm, that had Dr. Baillie and Dr. Babington been constrained to accomplish half the course of literature and science now recommended for common professional education, they would, from the very texture of their minds, have been utterly spoiled as physicians.

My experience of human life has long since convinced me, that the number of truly learned and scientific men in the world is small. Therefore, real learning, and real science, must be things of difficult attainment, since so many are engaged in their pursuit. But be their *attainment* ever so difficult, it is not half so difficult as their *use.*

Knowledge may be an incumbrance as well as a help. Many men know more than they are able to wield. There is a point (I believe) in the acquisition of knowledge (and this point varies infinitely in different individuals), beyond which, if more be acquired, the whole mass becomes useless to its possessor. I am acquainted with men who never have *done*, and never can *do* any thing, because they *know* too much; and I am acquainted with men possessing comparatively small knowledge, so dextrous in its use that they have ridden over the heads of others far, very far, their superiors in acquirement. Nothing is more common than to hear it said of some eminent and distinguished person, "Eminent and distinguished as he is, what would he not have been had he possessed the learning of such an one?" Whereas, if he had possessed one particle more of learning than he has, he would have been nothing at all; it would have weighed him down, and he would never have been heard of.

I am not speaking of pretenders, who succeed nobody can tell how — these are jugglers and mountebanks — but of those who succeed we *do know* how, and know it to be by dint of a knowledge not necessarily large, but solid and well chosen, which is (as it were) ingrained into their minds, and always at hand, and always producible for its purpose.

Fortunate, indeed, is the man who takes exactly the right measure of himself, and holds a just balance between what he can acquire and what he can use, be it great or be it small!

With all becoming deference to those who so loudly trumpet forth the praises of knowledge, and fright the trembling student with a portentous array of the wonderful things he has to learn, I would venture to crave some little regard for what is not so much as named by them, but what is pre-eminently more important than knowledge itself. I mean wisdom, as a thing distinct from knowledge, but not opposed to it; requiring, indeed, knowledge to work upon, but taking care to proportion that knowledge to the real end which itself (wisdom) has in view. I marvel that this wisdom is not enumerated among the ingredients of the physician's character, since it is conspicuously the chief of all, and was unquestionably that which gained for the two eminent men whom we have mentioned the praise which they justly merited from mankind.

It is, however, in its very nature, a thing too lofty for me to venture to describe. You shall learn what it is from one who well understood how distinct it is from mere knowledge, and who was himself endowed with it in a measure beyond ordinary mortals.

"Wisdom," says Robert Hall, "is to be distinguished from knowledge, to which it bears an affinity, but ought not to be confounded with it. Though wisdom necessarily presupposes knowledge, and it is impossible to exercise it in things of which we are ignorant, yet it ought to be something more practical, and rather more comprehensive: it ever bears a relation to the end; and, in proportion as it is more perfect, to the highest and the last end the agent can be supposed to have in view. It first judges of the end fittest to be pursued, and next determines what are the most fitting and suitable means of accomplishing it. It being the province of wisdom to preside, it sits as umpire in every difficulty, and so gives the final direction and control to all the powers of our nature. Hence it is entitled to be considered as the top and summit of perfection. It belongs to wisdom to determine when to act, and when to cease; when to reveal, and when to conceal a matter; when to speak, and when to keep silence; when to give, and when to receive; in short, to regulate the measure of all things, as well as to determine the end, and provide the means of obtaining the end, pursued in every deliberate course of action." *

More simply, but with equal majesty and truth, spoke another of congenial mind upon the same high subject: —

> "Knowledge and wisdom, far from being one,
> Have oft-times no connection. Knowledge dwells
> In heads replete with thoughts of other men;
> Wisdom in minds attentive to their own.
> Knowledge, a rude unprofitable mass,
> The mere materials with which wisdom builds,
> Till smooth'd, and squared, and fitted to its place,
> Does but encumber whom it seems to enrich.
> Knowledge is proud, that he has learnt so much;
> Wisdom is humble, that he knows no more." †

These words might have been spoken by an oracle, they are so suitable both to learners and teachers of our profession at the present day. We, of all men, ought to seek knowledge, not for the sake of being *knowing*, but for the sake of being wise; and those who are our masters, and are to tell us what we ought to learn, should not make a pompous announcement of all the wonderful things with which medicine may hold a possible alliance, but should prudently select and measure the knowledge required, with a view to the general capacity, and conformably to its end.

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* Vol. V. Sermon xxiv.
† Cowper's Task, book vi.

In laying down any scheme of education, you must take care to make it suitable to the majority of those who are to be educated. There may be circumstances in their condition and objects, rendering that education, which is the best in itself, not the best for them. Such circumstances belong, in an especial degree, to our profession. Very few enter it who are not to live by it: very few who are not required to exercise its practical duties *early*, from the necessity they are under of beginning as soon as possible to support themselves. So that the majority cannot wait to be made philosophers before they become practitioners.

These are homely considerations; but they are true, and most important to be borne in mind;—so important, that they, above all other considerations, ought to regulate the kind and extent of knowledge which should generally constitute the education of medical men in this country. Herein is involved a very urgent necessity. It is inherent in the state of society. You cannot alter it: you cannot evade it. Conform to it you must, if you desire to provide for the well-bringing up of those in whose assured competency to the fulfilment of their peculiar duties mankind have the highest interest.

This necessity, under which the majority find themselves, of exercising their profession *early*, requires that they should be made practitioners in the *easiest* and the *nearest* way. Their knowledge should be of things obviously and confessedly necessary, and this knowledge ought to be rigidly exacted, and nothing more; for if you go beyond this, you ruin the purpose you wish to serve.

There are, doubtless, many things *out of* the profession, by the previous knowledge of which the things *within* the profession are better understood. Such previous knowledge you may recommend, but you must not demand it. You may *recommend* that every man, before he enters upon the study of physic, should obtain the best general education within his reach; but you must specify nothing as absolutely necessary but what bears immediately upon professional use.

Now, that is *absolutely necessary*, and must be studied prior to experience, without which experience itself will hardly profit us when we have obtained it. And that is *absolutely necessary*, and must not only be studied prior to, but must be still cultivated simultaneously with, experience, without whose constant help and guidance experience itself will be cramped, and hindered in its exercise, and cannot go on to perfection. Of processes of disease, and processes of reparation; of the great remedial agents, and the powers which belong to them, and their modes of acting, and modes of counteracting, and the methods of their application; of these some knowledge must be had prior to experience, and a greater knowledge must continually go along with it. Anatomy, and chemistry, and materia medica, are the keys to such knowledge. You have, therefore, a right to specify these as objects of study, to affirm that a competent knowledge of them is essential to the practice of physic, and to exact it.

The same necessity which the majority are under of practising their profession early, and of circumscribing their education within a short period, while it imposes some limit and selection of the things to be learned, requires also a prudent method of teaching them.

Upon subjects, the proofs of which are contained in specimens and experiments presented to the eye, instruction can only be had by resorting to the places where such specimens or experiments are exhibited and explained. Most properly, therefore, are chemistry, and materia medica, and anatomy, taught in lecture-rooms, where the proofs are continually ready at every stage of the instruction, and the instruction itself consists in little else than exhibiting them in their proper place and order.

But are not medicine and surgery conversant with objects presented to the eye? and ought not they, in like manner, to be learned by the contemplation of those objects? Yes.

But in the lecture-room these objects cannot be constantly present, so as to keep pace with the instruction, and be appealed to as proofs. Description, therefore, is made to supply their place, and become their substitute. Description, however, is a poor substitute; for it is absolutely unintelligible, except to those who have some acquaintance with the reality.

How, then, is medical and surgical instruction to be conducted, so as to make it answer its purpose more effectually? By keeping its real objects more, and as much as possible, in view: and as those objects cannot be brought to the student, the student must be brought to them. As he cannot see them in the lecture-room, he must seek them in the wards of the hospital; and *there* he must seek his instruction too, if he is to obtain any. And even *there* he will find it difficult enough to learn, with the objects before his eyes.

I have long doubted whether systematic courses of lectures on medicine and surgery ought to be considered as essential a part of professional education as they are, and whether the rigid attendance upon them which is required does not stand in the way of other more indispensable means of obtaining knowledge; and whether they are not thus in danger of becoming a serious hindrance to the very purposes they are intended to promote.

You must go to the lecture-room, and see dissections, or perform them for yourselves, in order to learn anatomy: you must go to the lecture-room, and see experiments made, or make them yourselves, in order to learn chemistry.

And you must go to the wards of a hospital in order to learn disease and its treatment; for there only you can see the sick man, and inquire his symptoms, and give the remedy, and note its effects, and witness its success or its failure.

In the wards of this vast hospital, there are five hundred experiments continually going on, day and night; even the great experiments of appeasing pain, of repairing injuries, of controlling disease, of averting death. They are under the direction and superintendence of us, the physicians and surgeons. But we cannot take you into a room apart, and tell you what they are. They are open to your inspection. Go and see what they import. Your time is short. You will soon be engaged with the like experiments yourselves, and upon your own responsibility; and then, be assured, you will soon perceive that an acquaintance with all their particularities and details is essential to their success in your hands.

From what I have thought it my duty to address to you upon the subject of education, let no man impute it to me that I desire to degrade physic from the rank which has hitherto been conceded to it among the learned professions.

I believe (what my own observation has convinced me of) that there is a mischief in putting forth a vast inventory of miscellaneous things, to be learnt by those whose time is hardly sufficient for mastering that knowledge which is obviously necessary for practical use. I believe, also, that it would be absurd to demand from students generally, whatever might be the time and opportunities at their disposal, a perfect literary and philosophical education, in order to the exercise of our own or any other profession.

But although I do not enumerate Latin, and Greek, and French, and Italian, and German, and insist that all these you must know, yet I by all means recommend you to get as good a literary education as you can. Let each man learn as many languages, beside his own, as are within the easy reach of his time, his opportunities, and his understanding. For every language will furnish him with a key to new stores of professional information. But to know a language, implies its ready use, not a dark apprehension of its words and phrases. Our own unassisted mother-tongue is a better way to be wise than this.

Again, although I do not enumerate every department of science that has obtained a name, and tell you it is indispensable that you should be conversant with all, yet I recommend you to get the best scientific education you can. Let each man, according to his time and opportunities, pursue that department, or those several departments, to which his mind inclines: but let him take care to feel his ground firmly established beneath his feet as he goes along. For *here* all half knowledge is no knowledge at all. Even homely common sense arrives at much safer conclusions in the things which belong to medicine, than any scientific principles half understood, and misapplied.

The medical men of England do, and will continue to, keep pace with the age in which they live, however rapidly it may advance in the course of improvement. They need not be trained and sophisticated according to any compulsory discipline in order to do so. By such accomplishments as are congenial with their professional studies, yet unforced and unpretended,—by such moral qualities as, however they are engendered, are, I am persuaded, refined and exalted by their daily habits and avocations,—their character has been, and always will be, esteemed honourable, and their influence great.

Yes! their character is honourable, and their influence great: and yet they are little conversant with the vulgar means of popular credit. They are singularly abstinent from all passionate interference with subjects of mere temporary interest. No sect, no party in politics, has reckoned many of our profession among its clamorous advocates: but wherever there has been any association of good men for laudable ends—wherever any institution has sprung up having science or literature for its object—or any great scheme of benevolence been designed or perfected—medical men have been always found among their first, their most zealous, and useful promoters.

In England, too, there always have been among physicians those who have been upon an equality of education with the noblest and most learned of the land. They have been mixed with them at our public schools and universities; they have contended with them in honourable rivalry; and their minds have taken a congenial character from the similar studies of their youth. At length they have all separated to their several destinies for life. Some to the senate, some to the bar, some to the church, some to physic. These men, so educated, have ever afterwards looked with esteem upon each other, and each other's pursuits. And thus have the most illustrious men of every age, who could know nothing of physic as a profession, viewing it through those whom they have known engaged in it, been compelled to regard it with reverence and honour. In this way a credit has been derived to our common profession, in which every individual in every rank of it has partaken, when those whose good opinion is most coveted have taken their estimate of physic and physicians from contemplating the characters of such men as Dr. Heberden and Sir George Baker.

What has been will, I trust, ever continue to be; for I have a conservative jealousy of the rank due to my profession. I wish to see physicians still instituted in the same discipline, and still reared in fellowship and communion with the wisest and the best men; and that not for the sake of what is ornamental merely, and becoming to their character, but because I am persuaded that that discipline, which renders the mind most capacious of wisdom and most capacious of virtue, can hold the torch, and light the path, to the sublimest discoveries in every science.

It was the same discipline which contributed to form the mind of Newton and of Locke, of Harvey and of Sydenham.

LECTURE II.

AMPLE MATERIALS AFFORDED BY HOSPITALS FOR THE CLINICAL STUDY OF MEDICINE.—REASONS OF ITS COMPARATIVE NEGLECT.—ITS INDISPENSABLENESS TO SUCCESSFUL PRACTICE.—ITS MORAL USES.—RELUCTANCE OF STUDENTS TO ENGAGE IN IT.—SURGERY, WHY MORE POPULAR THAN MEDICINE.—WHAT CLINICAL INSTRUCTION IS IN THE STRICTEST SENSE.—METHOD OF TAKING CASES.—REMARKS UPON AUSCULTATION AS AN AID TO DIAGNOSIS.

I HAVE always thought that hospitals are not converted to half the good they are calculated to serve as schools of medicine; and I think so still.

I have always thought that, in hospitals, knowledge is perpetually running to waste for want of labourers to gather it; and I think so still.

I have always thought that, in our schools, every mode of lecturing has been unduly exalted above clinical lecturing; and every place where knowledge is to be had, or is supposed to be had, has been unduly preferred to the bed-side; and I continue to think thus.

With respect to clinical lecturing itself, custom has robbed it of its peculiar character, and, withal, of half its advantages, and half its popularity. It has been separated too much from the wards and the bedside, and has deviated into a discussion of abstract pathology and therapeutics. There may, indeed, be things which can be discussed with convenience and propriety only apart from the patient; and so let them be: but these bear a small proportion to the multitude of things which can only be learnt at his bedside, and in his very presence.

Here is a hospital containing 500 patients — a wonderful spectacle! Hither resort hundreds of students from every part of the empire. Here they see what the majority will never see again, after the period of their pupilage is over. They see collected in one place every variety of disease, and every variety of injury, and numerous specimens of each. What an opportunity of instruction gained, if rightly used; what an opportunity lost, if neglected!

And which is generally the case? Is the opportunity, in fact, generally used or neglected? I speak from my own certain conviction, and I answer, that it is generally neglected. I know that five out of six of those who profess to attend the medical practice of this hospital (and it is the same at other hospitals) never watch a single case of disease through its entire course, during the whole period of their pupilage. I say this with great sorrow, and as a warning to those whose pupilage has yet to begin. This is what I mean by the materials of knowledge running to waste.

Now, seeing among the students of our profession that desire for knowledge which I do, I must be slow to charge upon them a systematic disregard of things most essential. May I presume rather to suspect that the discipline they are subjected to is a little faulty? I should be sorry to prejudice students against the course of instruction laid down for them: I would rather urge them to greater diligence, that so they might overcome any little impediments which lie in their way. Nevertheless, my situation of physician to this great hospital having given me some insight into the system of instruction pursued, and convinced me that it does not work so well as it ought, it becomes my duty to point out where I think the machinery labours.

I think, then, considering the limited period which the majority of students can devote to their education, a great deal too much is required from them as preparatory to their becoming practitioners. Among the multiplicity of things which they must bring certificates of having learnt, there is a fear that they learn some very imperfectly, and some they do not learn at all; and there is a chance that what they thus learn imperfectly, or not at all, may be the very things concerning which it is most important that they should be competently informed. And such is really the fact. So pressing upon the student's mind and time is the necessity of attending a multiplicity of lectures, that he has neither attention nor leisure left to bestow upon the observation of diseases and the effects of remedies.

But how are you to abridge the catalogue of lectures, and what is there now taught which you could fairly exclude, in order to make way for a more ample observation of diseases in the wards of hospitals?

Anatomy must be learnt: the form, the situation, the structure of parts, must be known; even their intimate healthy structure should be much and often examined, by the medical student especially, that his eye may become skilled in detecting deviations from that structure, and tracing the visible vestiges of disease. Dissection, too, must be practised, by the surgical student especially, that his hand may be accustomed to the ready use of the knife. All the time that is bestowed upon it is, therefore, fairly due to anatomy.

Then come chemistry and the materia medica. And let no man who is making his entrance into the medical profession henceforth ever neglect chemistry. Chemistry was once thought to be conversant only with the physiology of external nature; but every day is bringing us to look more and more to chemistry to explain the physiology of our own bodies. It cannot, therefore, be suffered to become a less prominent part of medical education than it is. The same may be said of the materia medica. The articles of the materia medica are not likely, upon the whole, to increase in number; but those in use will require a more accurate study; more will be known concerning them, and more will consequently be to be learnt. Besides the natural history of many vegetables, there is also their chemical analysis. Chemistry has already detected, in several, the simple principle to which the whole plant is indebted for its medicinal virtue; and these simple principles are beginning to be largely and beneficially employed in practice. This, then, is not a time to abridge the study of the materia medica, when science is making in it new discoveries every day, and drawing from it more powerful and more convenient agents.

Then there are lectures upon botany; lectures upon midwifery, and upon the diseases of women and children; lectures upon forensic medicine. Now, I dare not say that the subject-matter of all these lectures is not of the highest order; and therefore I must not tell the student that *this* knowledge is less important than *that*, and that one lecture he may attend less diligently than another; I must only speak generally upon so delicate a subject, and contrive to intimate my opinion without giving offence. The prudent householder, when he would furnish himself a house, sees well enough that some things are of mahogany, and some of rosewood, and others of ebony and gold. He sees much for beauty and much for use, and longs, perhaps, to possess all. But his question is, "Can I afford to possess them?" and his answer, "No, not at present; and I must wait until I can." So, when there is laid before the student this magnificent furniture of the mind, and he asks himself, "Can I possess it?" I will answer the question for him, "No, you cannot at present."—"But can I ever possess it?"—"Certainly you can."—"But how?"—"By diligence and by *time*. Your studies will not be limited to the period of your pupilage, and you will know all these things in *time;* but certainly not in the brief space of two or three years."

Observe, I am not captiously finding fault with these formal requisites of medical education. The things themselves are excellent. But I cannot help wishing, either that fewer had been demanded, or that more time had been allowed for mastering them.

But when all the lectures in question have had their share of attention, and you have brought away from each what information you can, your most important business, to which all these serve but as the humble instruments, is still to be performed: you have to learn disease, and how to treat it; and there are lectures immediately subservient to this purpose, viz. lectures on the principles and practice of medicine; also clinical lectures; also attendance at the bedside of the sick; also examination of the bodies of those who die.

Now, lectures on the theory and practice of medicine profess to teach physic systematically, and to give an entire view of the subject down to the present day. They are a kind of medical orrery, in which fevers and inflammations, exanthemata and hæmorrhages, profluvia and cachexies, are made to perform their circumvolutions with wonderful order and propriety. And, as the youthful astronomer needs to contemplate some mimic show of the heavens, before he can profitably scan the heavens themselves, so the youthful physician needs (it is thought) some orderly representation of the whole, to make him know and admire the extent and nobleness of his art, before he begins to deal with its important realities.

Beware, however, of mistaking the intention of these systematic lectures on medicine, or of allowing your minds to rest in them for purposes which they are not intended to serve. They are introductory, and only introductory, to knowledge which is to be acquired by other means. These means are necessary and indispensable — so absolutely indispensable, that, without them, there can be no knowledge. The knowledge in question is the acquaintance with diseases in all their forms, and the acquaintance with remedies in all their kinds, and all their modes of application; and the means in question are intercourse, continual intercourse, with the human beings who are the subject of diseases. Diseases are not abstractions; they are modes of acting, different from the natural and healthy modes — modes of disorganizing, modes of suffering, and modes of dying; and there must be a living, moving, sentient body for all this.

This body must be your study, and your continual care — your active, willing, earnest care. Nothing must make you shrink from it. In its weakness and infirmities, in the dishonours of its corruption, you must still value it — still stay by it — to mark its hunger and thirst, its sleeping and waking, its heat and its cold; to hear its complaints, to register its groans.

And is it possible to feel an interest in all this? Ay, indeed is it; a greater, far greater, interest than ever painter or sculptor took in the form and beauties of its health.

Whence comes this interest? At first, perhaps, it seldom comes naturally: a mere sense of duty must engender it; and still, for a while, a mere sense of duty must keep it alive. Presently, the quick, curious, restless spirit of science enlivens it; and then it becomes an excitement, and then a pleasure, and then the deliberate choice of the mind.

When the interest of attending the sick has reached this point, there arises from it, or has already arisen, a ready discernment of diseases, and a skill in the use of remedies. And the skill may exalt the interest, and the interest may improve the skill, until, in process of time, experience forms the consummate practitioner.

But does the interest of attending the sick necessarily stop here? The question may seem strange. If it has led to the readiest discernment and the highest skill, and formed the consummate practitioner, why need it go further?

But what if humanity shall warm it? Then this interest, this excitement, this intellectual pleasure, is exalted into a principle, and invested with a moral motive, and passes into the heart. What if it be carried still further? What if religion should animate it? Why, then happy indeed is that man whose mind, whose moral nature, and whose spiritual being, are all harmoniously engaged in the daily business of his life; with whom the same act has become his own happiness, a dispensation of mercy to his fellow-creatures, and a worship of God.

Such a man any of you may be; but you must begin by learning to stand by the sick bed, and make it your delight.

But the interest of attending the sick, I have said, seldom comes naturally; it begins in a sense of duty. All men, especially young men, have a repugnance to scenes of misery. A single object of wretchedness is enough to disturb one at first;

but to find one's self at once transported into a throng of objects, where all are wretched, is apt to give a wrench to the spirits from which they do not always easily recover. It is here, then, just at the threshold of his practical studies, that the young man must rest upon his sense of duty. His sense of duty must rally him, and support him, and bring him back to the objects which he is so reluctant to face; and the interest will follow, if he is but just to himself.

I have now been a hospital physician many years, and many a succession of students has passed before me. I have not been an inattentive observer of their habits, and have remarked some things respecting the growth of this interest for the practical objects of our profession, which are really very curious.

At first all students are averse from visiting the sick; they have no fancy for the wards, either medical or surgical, and they especially shrink from the surgical. But when the repugnance is got over, and an interest begins to be felt, that interest is almost sure to be for surgery in preference to medicine; and yet, when they settle in life, their skill in surgery will be little called for, but nine out of ten of the cases which they treat will be medical.

Now, one reason why surgery is more popular than medicine is, that it is easier. Do not, I beseech you, imagine that I wish to disparage surgery. In a profession like ours, nothing can show such bad feeling, or such bad taste, as purposely to let fall expressions which cast an imputation of inferiority upon those who happen to cultivate a different portion of the same field of science and usefulness from our own. And even here I will allow, if you please, that cases occur in the department of surgery, beset with difficulties and perplexities, which we in the department of medicine do not meet with, and which require information, and judgment, and skill of the highest order to surmount.

But I am now speaking of the ordinary routine of cases, such as we find them in hospitals; and, upon a comparison of such cases, surgery is certainly much easier than medicine; and students take to it the more kindly because it is easier.

Surgery, for the most part, requires fewer circumstances to bring you to a knowledge of its object than medicine does. In surgery there are prominent points of interest, which arrest and command the attention at once; in medicine the points of interest are to be sought after, and, being found, are to be retained and cherished by much labour of the understanding. External sores, external inflammation, and broken bones, require only to be seen and handled in order to be known. But the same knowledge which, in surgery, is obtained by the use of the senses, in medicine, which is conversant with internal disease, can only be acquired by a process of reasoning; and reasoning is more difficult than seeing and touching, and its conclusions are more uncertain, and much more liable to error.

Moreover, the adaptation of curative means requires more vigilance in medicine than in surgery. There is no end of the circumstances to be taken into consideration day after day, in order to practise medicine with tolerable success. A man has an *external* inflammation: the surgeon sees it, and is at once sure of its existence; he prescribes for it, and sees its gradual decline as plainly as he first saw its rise and progress. A man has an *internal* inflammation; but the physician, not seeing it, is obliged to come to the knowledge of its existence by a great variety of considerations: he prescribes for it, and is again obliged to enter into a variety of considerations before he can know that it has begun to decline or has ceased. The uncertainty of physic I readily admit; but I do not admit the vulgar reproach which has followed from it. There is nothing absolutely sure but what rests upon the basis of numbers, or falls within the sphere of the senses. Where reasoning begins, there begins uncertainty; and on this account the highest and the best things in the world are all uncertain, and so is our profession. But from this very uncertainty those who practise it successfully claim their greatest honour: for where there is no possibility of error, no praise is due to the judgment of what is right.

Another reason why surgery is more popular than medicine is, that it is easier for pupils to make surgical cases a matter of discussion and conversation among themselves, and thus to convey an interest to each other respecting them. They can agree about the extent of this burn and that fracture, and understand each other when they talk about them; but concerning the progress of a fever, and all its circumstances — how they differ to-day from what they were yesterday, and what influence the means employed have had in determining the changes which have taken place — it is quite impossible that they should have any very general conversation. It is necessary to be in the presence of the patient to point them out. Language often fails of terms to designate them; and the most experienced often find a difficulty in making themselves intelligible to each other in speaking of them. There once flourished within these walls "The Medical and Philosophical Society of St. Bartholomew's Hospital." I fear it exists no longer. The time was that it was attended weekly by at least an hundred students and others. There was often no lack of discussion, and good discussion too, upon professional subjects: but the subject was almost always a *surgical* subject. I have already shown the reason why it was so. It could not be otherwise.

Again: young men like to be doing something—something that shall be real employment. Thus they are gratified while they are plastering, and binding, and dressing, &c. They see and they feel that they are promoting some object daily and hourly, with their own hands, for the benefit of the sick. But in medicine, the quiet and almost passive manner in which they are engaged about the sick requires a state of mind which is seldom possessed in early life.

Why do I mention all these things? In order to show you that I am well aware of all the circumstances which are apt to abate your interest for that department in which it is my duty and my desire to promote your instruction, and of all the difficulties I have to encounter, when I attempt to win you to it.

May I here be permitted to say a few words concerning myself? My office, as one of the physicians to this great hospital, makes it my first professional duty to further the studies of those who resort hither for instruction. A certain department is allotted me, and within that department I have, upon deliberation, chosen a certain course. If it be not essentially the best, it is at least that in which I feel myself to have the greatest capacity of usefulness. I desire that you should know what that course has hitherto been, in order that you may understand what it will be henceforward, and what you are to expect from me.

I have been physician here eleven years. Having no formal lectures to give, I have considered my business to be expressly in the wards of the hospital; and I have thought myself expressly placed there to be a *demonstrator* of medical facts. I use the term *demonstrator*, because it will at once carry my meaning to your minds; which is, that I have looked upon myself as engaged to direct the student where to look for, and how to detect, the object which he ought to know; and, the object being known, to point out the value of it in itself and in all its relations.

In prosecuting this my duty, I have betaken myself to the hospital at an early hour; and I have had a purpose in so doing. I have desired to meet the students before their minds were preoccupied with other things; that, among the interfering demands of other objects which arise in the course of the day, they should not have to catch a moment or that which, I consider, is the greatest of all—to steal a brief interval between lecture and lecture, and give it to that to which all lectures, and all the knowledge conveyed in all lectures, is but subsidiary and subordinate. I would not thank them for such an irksome wearied attention; I want them when their minds are fresh; and therefore I have always given myself to them when mine is fresh.

My visit to the hospital has occupied, generally, two hours; sometimes a little less, sometimes a great deal more. Half an hour of that time would be sufficient for me to prescribe for my patients, as well as I could, and satisfy my conscience that I had done them justice. The remaining hour and half I have given to the duties of my office as a teacher of clinical medicine.

But in this business of clinical instruction, I have not been the only instructor, nor have the means of information been limited to what I say or I point out. Surely this would be a poor kind of schooling — a giving and taking of scraps of knowledge, where one mind receives just so much as another mind may have to bestow. No; it has been my chief care to put every thing about the sick in the point of view most favourable for being well observed; that circumstances might become didactic; that they might give their own intimations, and speak to you themselves in their own tongues; and that thus you might accept knowledge neither from me nor from any one, but gather it fresh from the reality. Such, I consider, is the true method of clinical instruction. In short, whenever I have entered my wards, I have been accustomed to regard myself in no other light than that of one who presides over a great solemnity, and is engaged so to manage all its circumstances that they shall produce their appropriate impression upon the mind of the spectators. You are those spectators; and the solemnity you witness has many scenes and several actors, and one main subject runs through the whole. The scenes are the diversified incidents of many diseases; the actors are the sick themselves, and those who minister to them — the nurse, the physician, and the physician's attendants; and the great subject of the whole is the life of human beings consigned to our hands for a time, and used and treated according to our pleasure, and always for purposes of good. This life is by all means to be saved; its diseases by all means to be alleviated or cured; and the arts and methods of saving, and curing, and alleviating are to be so displayed, that the benefit and blessings of individuals may be multiplied infinitely.

But how multiplied infinitely? Even through you. Recollect you are the spectators; I am but the actor. For this is a case in which the spectator's place is a thousand times more important than that of the prime agent, if the measure of things be calculated by the result. My business is with the few individual patients before me; and whatever good or whatever evil I do, would be strictly limited to them, but for your presence. Yes, you are there to take note of the errors into which I may fall, that you may avoid them, and so restrict the mischief within its present sphere; and you are there to take note, also, of the good which I may do, and learn the method of doing it, and make it your own, and carry it abroad with you, that it may bear fruit an hundred-fold, and be multiplied among all mankind.

You will perceive, then, that with me clinical instruction is, as little as possible, a matter of formal lecture. I will tell you the manner of my proceeding.

Upon the admission of a patient, my first object is to learn the exact nature of the disease I have to deal with; and this is done by my own observation, and by inquiries to which the patient himself or his friends make answer. This is taking the case.

Now, in taking the case, I desire always to proceed after a certain method; and, when I am able to pursue that method, all the circumstances which I seek to know unfold themselves naturally and easily, and then it is a simple, agreeable, and interesting employment.

But often, very often, I am driven from all pretence of method in taking the case. The poor patient is embarrassed by the novelty of his situation, or he is deaf, or his disease incapacitates him; and he hardly understands your questions, and gives you strange answers. Thus things drop out confusedly one after another, and you must be content to accept them as they come, and join them together as you can. But, upon these terms, taking a case becomes a very irksome disagreeable business.

In taking the case, however, if I am able, I always proceed thus: —

The patient being placed before me, I ask him no question until I have learnt every thing worthy of remark which my own eyes can inform me of. His physiognomy; his complexion, whether florid, pale, or dusky; the general bulk of his body, whether large and full, or spare and wasted; the condition of particular regions, whether swelled or attenuated; and of the surface, whether there be any eruptions or sores upon it, and what is their character; and, lastly, the power of locomotion, whether he have free use of his limbs or not.

All these are most important particulars, and we ought to make much of them. There can be no doubt concerning them; they are objects of our own observation, and come to us authenticated by the testimony of our own senses. One step securely ascertained leads to another; and from what we see upon the exterior, we obtain a clue for directing our inquiry to the seat and centre of the disease within. If locomotion be hindered, we look well to the brain and spinal marrow; if there be the livid lip and dusky skin, we scrutinize particularly the condition of the heart and lungs; if the whole body, or some of its parts, be attenuated, we examine well the organs of nutrition.

Having thus learnt all I can with my own eyes, and felt the pulse and seen the tongue, I next proceed, in taking the case, to that further inquiry in which the patient takes a part: and first, I ask him concerning his general sensations, especially whether he be hot or cold; and I endeavour to learn whether his heat and cold occur under conditions which constitute fever.

Next, I inquire into the state of particular organs; and, beginning with the head, I ask after pain, vertigo, and sense of weight, the sight and the hearing, and sleep and wakefulness. Many of these things are only glanced at, or perhaps passed over altogether, if there be no reason to suspect disease of the brain.

Then, passing to the chest and respiratory organs, I ask concerning pain and cough and expectoration, and the state of the breathing under various conditions of exertion and in different postures of the body; and I learn the force and extent of the heart's pulsation.

These things are hardly dwelt upon, or soon despatched, if there be no suspicion of disease in the chest; but if there be, not all we can learn by simple inquiry is enough to ascertain its nature. The patient must, moreover, be submitted to the process of auscultation. This process, however, in order to avoid interruption, I postpone until other inquiries are finished.

Lastly, proceeding to the abdomen, I ask here also concerning pain and uncomfortable sensations the appetite, the digestion, and the evacuations, their frequency, quantity, and appearance; and then I ascertain with my hand its form and fulness, the possible enlargement of particular viscera, the effusion of fluid, or the existence of pain upon pressure.

Here the examination of the patient ceases, as to his actual condition; but the history of his complaint remains to be learnt, its origin and its progress hitherto, and its probable exciting cause.

Perhaps it would seem more in the order of nature, and therefore the best method, to take the history first of all. Formerly I used to do so, but I found it practically inconvenient. If you first learn the existing complaint, you know how much of its previous history you will require to illustrate it; but if you first inquire the history, since you do not yet know what it is to illustrate, you cannot tell how much of it you shall want, and must allow the patient to tell what he thinks fit; and, since every person's complaint is interesting to himself, he is apt to discourse about it rather too much at large, and too little to edification. Therefore it is, that I now always inquire the history last, inverting (if you please) the order of nature; and I take care to make the patient answer express questions rather than leave him to expatiate at his own discretion.

And now the case is taken and recorded in a book by the clinical clerk: not that I deliver over to be recorded all the circumstances that come out in the progress of the examination, but only such a selection of them as may serve to declare the disease, and furnish guidance and direction in the treatment of it.

The case, I say, is now taken, provided there be no suspicion of disease in the chest. But if there be, the patient must be submitted to the process of auscultation.

What auscultation is, and the philosophical principles which recommend it as an instrument of diagnosis, it belongs to the lecturer on the principles and practice of medicine to teach you. But as, in the course of my clinical instruction, I shall lay great stress upon it, and at every visit shall present you with instances of the necessity of using it, and shall invite you to give much time (for much will certainly be required) in order to learn to exercise it skilfully, you have a right to expect from me, who have employed auscultation in this large hospital eleven years, some observations concerning it, and some estimate of its value.

The more accurate physicians of our own times have not disdained the guidance of another sense in the investigation of disease. They make use of the hearing as well as the touch and the sight; and in those things which are more fitly and naturally subjected to it, they have found it not an unfaithful interpreter of the truth.

Auscultation, as it is called, professes to furnish important aid in the diagnosis of diseases appertaining to all the organs within the chest. Its use, however, has not yet become popular in this country, nor is its value ascertained.

There are those who condemn it as absolutely worthless, and there are those who commend it as infallible.

Its vehement and unqualified condemners, judging from what they write and say, are absolutely ignorant of, and unpractised in, its use; and its unqualified commenders are probably of that happy temperament which is naturally averse from admitting the real difficulties of any subject, and therefore find none in medical diagnosis, which is of all things the most difficult, whatever be the means employed for its illustration.

But there are many sober, well-informed men, who, having the opportunity, have thought it their duty not to spare the necessary pains of practically acquainting themselves with a method of inquiry which comes recommended to the world by one of the soundest pathologists that ever lived: and among these there will not be found one who does not attach some (and that a very considerable) value to its use.

A priori, it would not have been believed that the pulse could ever teach us what it does. Sir John Hawkins, in speaking of a visit he paid to Dr. Johnson one day during his last illness, says, "Before my departure, Dr. Brocklesby came in;

and taking him by the wrist, Johnson gave him a look of great contempt, and ridiculed the judging of his disorder by the pulse."

If we had heard, for the first time in our own day, of some physician going about this town and putting his fore-finger upon the wrists of his patients, and professing to know, from something he found there, that this man had an inflammation of his lungs, and that man of his bowels, and presuming to prescribe bleeding and other gigantic remedies, simply from faith in his own infallible fore-finger, grave men would denounce him as a dangerous quack, and pleasant men would hold him up as a fair subject for ridicule.

Yet use has so educated the fore-finger of us all, that this is the very thing we are now doing every day of our lives. When, therefore, so much is confessedly learnt by one sense, it is rather hasty to conclude that nothing whatever can be learnt by another. When, by touching an artery, be the disease what it may, and seated in whatever part, we seldom fail to gain some knowledge concerning it, and some suggestion how to treat it, why should it appear incredible that two particular organs only, the lungs and the heart, should submit some of their diseases to the cognizance of the ear?

Concerning the sense of hearing, in relation to its proper objects, and in relation especially to diseases of the heart and lungs, no man can learn from another the kind of information which it is able to convey; every one must teach himself. In this respect it is with hearing as it is with touch. You may talk of a hard and a soft pulse, of a full and a small, of a quick and an irritable pulse; but be assured you thus convey no intelligible idea, except to those who are by practice as conversant with the pulse as yourself. So, too, with respect to the heart, you may talk of its sound being clear or dull, near or distant, limited or diffused; and, with respect to the lungs, you may talk of the bronchial and vesicular respiration, of the bronchial voice, and pectoriloquy, of rhonchus and sibilus, and large and small crepitation; yet none can understand you but those who have given much time and pains to the exercise of auscultation.

Let us recollect that the pulse submits none of its qualities, but those which respect its number, to actual measurement; all the rest are determined according to the perceptions of the person who feels it. Yet, concerning these, there is a tolerable agreement among medical men. It is the same with the heart. The number of its contractions may be counted, and therefore never can be doubtful; but the modes and qualities of its contractions, which are many, are determined according to the perceptions of the person who hears them. These, however, like the kindred qualities of the pulse, are accustomed to strike all who habitually attend to them in the same way.

Summarily, then, concerning auscultation, my experience (I think) warrants me in saying thus much: — 1. That there are some diseases of the chest which in their *kind* entirely elude it; 2. That there are some which elude it not in their kind but in their *situation;* 3. That there are some in which auscultation is only a help to diagnosis, but still a very great help; 4. That there are some (and perhaps the larger number) in which the conclusions of auscultation are as unerring as those of sight itself.

Certainty is a big and portentous word, applied to any the smallest portion of our art. Yet still there is a small district of the whole field of diagnosis, but a large district as it respects particular organs, which auscultation has rendered absolutely certain.

With auscultation I almost always use percussion; and the results of the one perpetually correct or confirm the results of the other, and strengthen the diagnosis.

But does all clinical instruction consist in directing the mind how to ascertain mere particulars, whether by auscultation or percussion, or by whatever other method is adopted for their discovery in different organs? No. Clinical instruction is not merely occupied in directing observation to facts, but it assists the mind in estimating their value. Thus, when the record of the case has been read aloud, I admit you to share in my deliberation upon all its particulars, while I endeavour to assort them and bring them together, and make them yield all the light they are capable of throwing upon the nature and seat of the disease. Sometimes I can at once come to a confident diagnosis; and when I can, I at once announce what it is, and give my reasons for it.

Sometimes, after great pains of inquiry, I am still in the dark; and when I am, I say so, and desire to reserve the case for future examination.

Sometimes, perhaps most frequently, I feel that I have a tolerably right notion of the complaint, but require some circumstances to be more clearly made out, before I can be absolutely certain. And then I state what are the circumstances which give me the notion that I have, and what I still desiderate to bring me to a more confident conclusion.

The case still remains to be prescribed for. In prescribing, I endeavour to be as simple as possible, to make the indications of treatment as intelligible as possible, and the object I have in view clearly seen.

The case thus examined, and commented upon, and prescribed for, I then commit to your future observation as a medical study.

In the further progress of the case I am still present, not to give formal lectures, but to take care that none of the circumstances which continue to develop themselves may fall to the ground profitless; and that you may be tutored by *them*, and not by *me*.

Not one only, but many cases, I shall thus consign to your study with the like care; and in all I shall be continually at hand to render you my assistance. That assistance, however, I shall never interpose, so as to hinder the exercise of your own independent observation, and mar the very purpose of clinical instruction.

With respect, however, to formal lectures, as a part of clinical instruction, I will say this: that the teacher would do well occasionally to call his pupils together, and state to them his own views (for every man *has* his own views) of certain leading points of pathology; for these views, he must be conscious, give a bent and direction to every remark he makes upon the objects which he and his pupils are daily contemplating together; and it is desirable that they should have the best key to interpret him by. This would require a formal lecture.

Again, for the same reasons he would do well to acquaint his pupils with any general principles at which he may have arrived in the treatment of disease. This, too, would require a formal lecture; and such lectures I am almost tempted to promise you, if I was sure they would be acceptable. But it must not be yet; for I am not certain that we should at present quite understand each other upon these interesting subjects.

The progress of the human mind is evermore from particulars to generals; and he that would inform others must be careful, in the manner of his teaching, not to transgress the order of nature. Full of this important truth, I must first seek to rivet you to the contemplation of individuals, and only venture to unfold to you any general principles, which I may conceive myself to have reached, either of pathology or practice, in proportion as I judge you able to authenticate them by your own growing experience.

But it is *your* present duty to exercise your observation carefully and unremittingly; and it is *my* present duty to point out the fittest objects, and place them in the light in which they can be most profitably seen.

If ever the desire to view the beauties and sublimities of nature has led you to ascend some lofty eminence, you have probably taken with you one more familiar with the scene than yourselves, as a guide; but you have still trusted to your own eyes and your own feelings, to fill you with the delight of the prospect, and tell you what to admire and wonder at; and you have required no more from the guide than to point with his finger, and say, "See here, and see there."

So in entering this place, even this vast hospital, where there is many a significant, many a wonderful thing, you shall take me along with you, and I will be your guide. But it is by your own eyes, and your own minds, and (may I add) by your own hearts, that you must observe, and learn, and profit: I can only point to the objects, and have little more to say, than "See here, and see there."

LECTURE III.

FURTHER REMARKS UPON TAKING CASES. — SUGGESTIONS AND CAUTIONS IN THE READING OF BOOKS. — SYSTEMATIC, NOSOLOGICAL, PRACTICAL BOOKS. — THE DEGREE IN WHICH THEY ARE VALUABLE TO THE STUDENT. — DR. CLUTTERBUCK. — M. BROUSSAIS. — MR. ABERNETHY. — DIVISION OF PRACTICAL MEDICAL LITERATURE INTO THAT WHICH REGARDS WORKS OF OBSERVATION SOLELY, AND THAT WHICH REGARDS WORKS BOTH OF OBSERVATION AND RESEARCH INTO MORBID PROCESSES. — THE LAST PROPERLY CALLED THE PATHOLOGICAL, AND ESPECIALLY RECOMMENDED TO THE STUDENT.

THE student often asks me such questions as these, —"Would you recommend me to note cases down for myself in writing? What books should I read, or what studies should I pursue, in aid of my daily observation of disease?" These are certainly very important considerations, and I will now give you the best advice concerning them I am able.

I often see young men, at the very commencement of their attendance upon medical practice, taking cases; and when I do, I always dissuade them from doing so. At present, it is quite impossible that they can do what they desire: they literally cannot take a case. Their present business is to observe. They must learn to know the things themselves before they can put them down and set them in order for use and reference.

I will venture to give this general advice. During the first three or four months record nothing; use your observation to the utmost; be continually in the wards, looking at the sick and asking them questions; be inquisitive about the effects of medicines; be listening perpetually, with your bare ears or with the help of the stethoscope, at the chest, that you may become familiar with the sounds of healthy respiration and the healthy contractions of the heart; and then try to use the same means for the detection of disease. Accustom yourselves to feel the pulse; the number of its beats is easily measured, but it has qualities which are referable only to the sensations of him who feels it, and you must educate your touch to the discrimination of them; for these qualities, much more than its mere number, serve to guide us in the detection of disease and the method of treating it. The tongue, too, must be often looked at, before you will be able to detect upon it the marks which are morbid. There are certain secretions also, the different morbid qualities of which you must learn by frequent examination: the expectoration, the urine, both have qualities upon which may depend the diagnosis of disease and the choice of remedies. I am not now making any orderly enumeration of symptoms, but merely instancing a few cardinal points with which habit must render you a little familiar, and enable you to appreciate the information they are calculated to convey, before you can take cases for yourselves with any promise of advantage.

Let me also mention the physiognomy of disease. This can never be adequately described, and I urge you always to remark it and to dwell much on it; for some acute observers have drawn such secrets from the expression of the countenance, that it has been to them in the place of almost all other symptoms.

I would recommend, then, that for three or four months the student should allow his curiosity to range discursively over every variety of disease, familiarizing himself with the great signs which belong to all, before he binds down his mind to the rigid contemplation of particular cases. When I say discursively, I still mean diligently, and with an earnest purpose of improvement; and, in the course of three or four months thus employed, you will pick up much real knowledge, you hardly know how; but you will find it such as will stay by you.

And now you may begin to take cases: but take only a few at first, and be discriminate in your choice; let them be instances of well-marked acute disease; and, when you enlarge your number, I would advise you to employ yourselves upon several of the same denomination at the same time. Take three or four cases of dropsy, or of fever, or of rheumatism. Thus you will learn, by the benefit of comparison, what can be learnt in no other way. You will see shades of difference in the diseases themselves, arising from external circumstances or from the different constitutions of those who bear them, and a consequent variety in the modes of treatment required.

Take your cases in one of two ways. Either take them altogether independently for yourselves, or copy them out of the book kept by the clinical clerk, adding any particulars of observation or comment which may have occurred to your own minds during their progress. The last is the least laborious way, and for a beginner (I think) the best, provided you make a point of never copying cases which you have not attentively watched during their whole course. At all events you might trust to the clinical book for furnishing you their frame-work or leading facts, and their history; and thus leave yourselves more at leisure to note down your own remarks from day to day, as the cases proceeded. If, in this employment, you make a good selection, and do your work carefully, you will, at the end of your hospital attendance, take away with you a little body of practical medicine founded on your own experience, which will be useful to you, very useful, as long as you live.

Do not let a suggestion which I am going to add seem trifling or impertinent. I would wish to see the freest intercourse between pupils, with a view to mutual instruction. I would rather find two or three taking the same cases together, than one so employed alone. You have it in your power thus to give infinite help to each other. Of all modes of instruction that is the most agreeable, and often the most valuable, where one, a little senior, or a little more advanced in knowledge, communicates information to another not quite so forward. There are, besides, many little difficulties which no man can tell you better how to surmount than he who has just succeeded in surmounting them. At this day I continue to feel gratitude to two or three individuals a year or two senior to myself, whom I found at this hospital when I first became a student.

Then comes the important question, What books the student should read, and what studies he should pursue, simultaneously with his attendance in the wards of the hospital, in aid of the objects he has now in view?

Perhaps it may appear very strange to you, that, while you are intent upon observing the symptoms of diseases and the effects of remedies, I should advise you to be very sparing in reference to books which treat expressly of such matters. You see the things themselves; then why learn them at second hand? I do not know that I have any objection to certain elementary books —"Vade Mecums," "Practical Manuals,"—provided they are short. Such books are to the medical student what maps are to the traveller. They give a succinct summary account of the whole subject according to the last survey; they help him to explore the country; but no man can be said to know a country who has gone over it only on the map. The map may have given him his first general notion of it; but his more intimate acquaintance with it, that sagacity which enables him (if I may so say) to take the right turn in the dark, can only come from the habit of perpetually traversing it. Such are elementary books of practice to the student of physic. He wants them to tell him where he is, and just to give him a start; but he must never trust to them for any thing beyond this. The misfortune is, that these books are too often read, not to assist, but to excuse the labour of practical observation. Many a young man has preferred to sit by his fire-side and read "Thomas's Practice of Physic," to a diligent attendance upon the sick in the wards of a hospital; and the consequence has been, that he has started into practice with Thomas under his arm, and nothing else, and Thomas and he have been companions through life, and he has never been able to do without Thomas to his dying day; seeing and reading all things through Thomas's spectacles.

Then there are books which give definitions, or succinct descriptions of diseases by name. Not long ago, Cullen's "Nosology" was the most popular, indeed the only, book of the kind in use. But of late there has been a larger demand for such books, and the supply has equalled the demand. Nosologies are resorted to by the student to enable him to learn "Practice" (as it is called) in a much shorter time than his observation of actual diseases and their treatment in the wards of a hospital can possibly teach it him. It would take him two or three weeks at least to watch any actual case of fever through all its stages, while *by his book* he gains an acquaintance (such as it is) with all the kinds of fever that were ever heard of in half the time.

But Nosologies teach the student "Practice" in no other sense than that of enabling him to seem to have a knowledge which he has not in reality. They qualify him to pass his examination, not to understand and to treat disease.

This examination is an important concern; and the majority of students have unfortunately found out that they can fit themselves for it by other means than those which they are enjoined and invited to pursue. But it is my duty to tell you, that, while you are committing to memory these technical arrangements of diseases, and absenting yourselves from the hospital, and fancying that you thus gain time in respect of one particular purpose, you lose time wofully, perhaps irretrievably, in respect of the great business of your lives. Nor is the loss of time the greatest evil: your minds are led astray from their proper object; for, while you are learning a Nosology by heart, you are no more studying Physic than if you were digging and delving in a field.

It has often grieved me to see young men saunter about the hospital square, with a little book in their hands, *grinding* a Nosology, which they are sure to forget in a few months, instead of going from bed to bed, full of interest and alacrity, and gathering knowledge which would become their own, and remain with them as long as they live.*

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* It would be happy for those who have but a short time to bestow upon the study of their profession, if that method which alone is calculated to make them good practitioners was the only one they could pursue respective to their examination. I believe that things might be so ordered as to produce this result. I offer the following remarks upon the subject.

Every one should be examined upon what he has seen, and that only; and he should be expressly asked what that is before he is examined. He should be asked what diseases he has actually observed during his hospital attendance, and then made to give a strict account of them and their mode of treatment. An attendance upon medical practice during a whole twelvemonth, in a large hospital, would bring him acquainted with an immense variety of diseases; so that there would be no fear of the examiner's interrogatories being cramped within too narrow a sphere.

What encouragement would it be to a zealous pursuit of practical medicine, if the student knew that this would be the form of examination to which he would be ultimately subjected!

But even if this were the case, it would, in my notion, still fall short of what is both desirable and attainable. I believe we have been all hitherto wrong; or, to speak more boldly still, I believe the best schools never yet were right, in the

There is another class of books, not systematic, yet purely practical, which professedly discuss the

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prescribed modes of imparting, and acquiring, and ascertaining the knowledge of practical medicine. The very examinations themselves should be conducted in the wards of the hospital. The presence of the patient is necessary at every step, for teaching, for learning, and, finally and most of all, for examining. Surely it is not possible to tell whether a man knows disease unless you see him in the very act of searching after it and finding it; or whether he can treat disease, unless you see him while he is applying his remedies to it.

But (it would be said) the arrangements of a hospital would not admit of all this. Nothing would be easier. This great hospital can provide for any thing which is manifestly conducive to the public good. I would only ask for a small ward containing half a dozen beds; and these beds should be occupied by half a dozen well-chosen cases, drafted from the rest of my patients.

This ward should be my clinical school, and into it none should be admitted but myself and half a dozen pupils. These I would have under examination for a month, and then the same number should succeed them; and so on, month after month, all the year round.

But how should I thus have them under examination for a month? By making them act before me, for a month together, the very part they will have to act, for good or for evil, as long as they live. They should have the cases under their own care and treatment, but strictly under my superintendence; for this superintendence would constitute the examination. They should question the patient before me, and apply whatever means they thought fit for the detection of his disease, and give their reasons for whatever notion they might form of it. Then they should prescribe before me, and make choice of their remedies, and give their reasons for whatever indications they thought fit to follow in the treatment. In short, every day they should give the same sort of little lectures as I am accustomed to give upon each patient as I go round the wards.

At the end of the month, I would give a certificate of competence to those whom I thought deserving of it.

This method, besides being the best possible test of the treatment of diseases, and their nature and essence, entirely with reference to their cure. They are generally written upon some one particular disease, or upon several diseases of a like character. Some of them you will feel a great temptation to read.

Among this class are found the great treasures of medicine; and among the writers of them are found the great benefactors of the human race. The writer of a good practical book on medicine, who tells the world something which it did not know before, something of large application in fortifying or restoring the health, strength, and

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knowledge which a man had already acquired, would also be a lesson of instruction in the use of it. Such an examination, or rather such a practical exibition of knowledge, in its use and exercise for a month together, would have none of the annoyance, either actual or prospective, which belongs to examinations as they now are. As this would be the most profitable, so it would be the most pleasant part of the student's professional education. There would be none of the posing and puzzle of formal interrogatories, but, instead of them, there would be the ease and comfort of the most unreserved communion between pupil and teacher, upon the subjects most interesting to both.

After a student has gone through his prescribed course of education, and been examined, he is ready to practise as soon as any body will employ him; and I would ask any person of common sense to which of the two he would submit his body with the greater confidence—to him who had Vogel, Sauvages, Cullen, or any other nosologist, by heart, or to him who, having spent a twelvemonth in the diligent observation of a great variety of diseases in a large hospital, had brought his knowledge to the test of practice during a whole month under the eye of the physician?

comfort of man's body and mind; or who, if he tell nothing new, yet wisely sets in order what is already known, and gives it a better and more convenient adaptation to the same high purposes; such a writer, in all just estimate of things, is second, and second only, to the great expounders of moral and religious truth.

But, unhappily, among this same class of books is also found every thing that is wretched in the literature of our profession; and the bad practical works have a mighty predominance of quantity over the good.

In the shape of practical treatises our own age and country has bred, and is breeding, and the press is assisting at the birth of, the oddest and most worthless trash; and this often obtains a wide circulation, and a strange popularity.

While you are watching various diseases, you cannot help feeling a desire to know what they have said concerning them, who have expressly written about them; and in your wish to read something, you are, without direction or warning, as likely to lay your hand upon a bad book as a good one: nay, more likely, for a bad book is generally a very easy book, having been composed by its author with no labour of mind whatever; whereas a good book, though it be not necessarily a hard one, yet, since it contains important facts, duly arranged, and reasoned upon with care, must require from the reader some portion of the same attention and study to comprehend and profit by it, as it required from the writer to compose it. A good book, at all events, is never a very easy book, and never suddenly popular.

What books of the practical kind you should read, I will tell you presently; what you should not read, I will tell you now.

Never read any book that bears internal marks of being addressed more to the public than to the profession. They are all bad, and many dishonest.

Mind that you are not betrayed to commit yourselves unwarily to books (especially of modern date) upon diet and digestion, upon the liver, and the stomach. Unfortunately, the public is well understood to have such a relish for reading upon these subjects, that new motives have been thus let in for medical authorship, which are not very creditable. There is a demand for books of the kind; and if they are executed with some plausibility, they have a certain sale, and a certain kind of reputation is gained by them. Any of you, who may feel himself a little sharp and clever, might write such a book to-morrow, with a tolerable chance of all its attendant advantages. There is not a medical publisher in this town who would not give you something handsome for a book "upon the stomach."

But there are books upon practical medicine, written in our own times, much talked of, and containing much that is good; which, nevertheless, a student just beginning to observe for himself would do well to avoid, for they are sure to give an undue bias to his mind. Books, I mean, in which you find some strong predominant theory; as where numerous diseases, apparently different, are uniformly ascribed to some single cause, and an uniform practice recommended in conformity to the theory: where, for example, every sort of pain, in whatever part, or every species of nervous complaint, is attributed to plenitude or emptiness of the blood-vessels, or to errors in the functions of the liver, or the stomach, or the duodenum, or the bowels generally; and bleeding or leeches, or mercury or purgative medicines recommended accordingly.

I do not mean to say that such books may not be read with profit; but they can only be so read when the reader is able to guard himself with the checks and reserves of his own experience. They have, for the most part, been written by men of talent; and, in attempting to show that all, or nearly all, diseases are cured by the pursuit of one indication of treatment, while they fail of establishing the point they intend, they succeed in establishing something short of it. They often show that the indication in question is just in many cases, and that it is one which deserves to be borne in mind in all.

The seat of fever is placed by one modern author, whom I greatly respect, in the head; and by another, in the abdomen. According to the one, all febrile movements radiate from inflammation of the brain as their centre; according to the other, from inflammation of the mucous membrane of the bowels. The doctrine of both, as a piece of philosophy, is untrue; but still both Dr. Clutterbuck and M. Broussais have deserved well of the profession, in so far as they have contributed to establish two paramount indications in the treatment of fevers — by showing, that in numerous cases our success will entirely depend upon the undeviating steadiness with which we address our remedies to the head or the abdomen. Hereafter you may read these books, but not at present.

I think I can illustrate all I have to say by one great example. Recollect, I am cautioning the student, the medical student especially, against trusting his mind to the fascination of any tempting theory, before he has put it fairly upon its guard by much independent observation of his own.

The work of Mr. Abernethy, upon "The Constitutional Origin of Local Diseases," has extraordinary merit and originality. The substance of the whole is this, — that local diseases are rather symptoms of a disordered constitution than primary and independent in themselves; and that they are to be cured by remedies calculated to make a salutary impression on the general frame, not by topical dressings or any mere manipulations of surgery. All this is good, and entirely justified by experience.

Next, that this disordered state of the constitution either originates from, or is rigorously allied with, derangements of the stomach and bowels; and that it can only be reached by remedies which first exercise a curative influence upon these organs. Even thus far it is a beautiful theory, and I am not disposed to deny it a large share of truth.

Then come to be considered the real nature of these visceral derangements, of which little distinction is made, and the remedies proper for their cure, which lie in the small compass of a blue pill, or a compound calomel pill, at night, and a mixture of gentian and senna in the morning.

Practically the sum of all is this: that be the local disease what it may, the constitutional ailment what it may, and the derangement of the stomach and bowels what it may, this one method of treatment is at all times applicable.

What a tempting theory! and what a still more tempting practice! As soberly set down in print, the student can hardly help receiving them; for, being once faithfully received, what a world of tedious study and observation must they save him.

You, who never knew Mr. Abernethy, and have only read the doctrine which I have endeavoured to sketch, as it is carefully and beautifully developed in his book, have no notion what he made of it before his pupils in this room. A vein of it ran through every lecture that he gave. In his book it stands as a suggestion to surgeons, concerning the constitutional origin and treatment of local diseases; in his lectures it acquired an amplitude and extent which embraced every kind of disease incident to man.

You, who never knew Mr. Abernethy, have no conception of his powers as a lecturer. He so eloquently expounded some of the highest truths; he so nicely disentangled the perplexities of many abstruse subjects; he made that so easy which was before so difficult, that every man who heard him feels perhaps to this day, that, for some important portion of his knowledge, he is indebted to Mr. Abernethy. But he reserved all his enthusiasm for his peculiar doctrine; he so reasoned it, so acted it, and so dramatized it (those who have heard him will know what I mean); and then in his own droll way he so disparaged the more laborious searchers after truth, calling them contemptuously "the Doctors," and so disported himself with ridicule of every system but his own, that we accepted the doctrine in all its fulness. We should have been ashamed to do otherwise. We accepted it with acclamation, and voted ourselves by acclamation the profoundest of medical philosophers, at the easy rate of one half hour's instruction.

The great Lord Chatham, it is said, had such power of inspiring self-complacency into the minds of other men, that no one was ever a quarter of an hour in his company without believing that Lord Chatham was the first man in the world, and himself the second; and so it was with us poor pupils and Mr. Abernethy. We never left his lecture-room without thinking him the prince of pathologists, and ourselves only just one degree below him.

Now that an important practical doctrine had been unfolded, is most true; and that it had been carried to an unwarrantable extent, is most true also: but how far to accept it, and how far to reject it, were questions for the sober judgment of a matured experience.

Therefore I do say, that this great teacher, in so far as he taught an exclusive doctrine, and claimed for it an almost universal application, and won an acceptance for it by the fascinations which genius, and fancy, and eloquence can command,—gave a hurtful bias to the mind of the student, and indisposed him to the indispensable task of observing for himself. For how is it possible that the mind, the youthful mind especially, can bind and buckle itself to the labour of getting possession of knowledge in the hardest possible way, by sifting every particular, and by patiently observing at the bedside, when it believes itself already furnished with all the wisdom which such laborious and *jealous* processes can ever teach? Yes, observation of disease is not only a laborious but a *jealous* process: it allows nothing to pass but under the warrant of the most cautious reasoning, or of the senses themselves; for these are the natural sentinels of the truth.

Summarily, then, I will venture to say, of all books which enter minutely into the practical examination of particular subjects, and those especially which open peculiar views, that it requires much personal experience to form a correct judgment of them, and to profit by them. While you are yet inexperienced in the subject-matter, you may be pleased with them as an argument, or a process of reasoning, and thus they are likely to make an undue impression upon your mind. But you will be at a loss about the simple conceptions, which are the pith and marrow of the whole. Under such and such conditions, and on such and such emergencies, says the writer, I reason thus; and this is my view of the case; and this is my practice. But to estimate the justness of his views, and the propriety of his practice, you must first be familiar with the conditions and emergencies he speaks of.

I fear that by this time you are beginning to fancy me possessed of some strange prejudice against books; for that, whether they be good or bad, I still find some reason for advising you not to read them.

Indeed, it is not so. In what I am now saying, I am only endeavouring to explain myself a little more at large concerning a subject upon which I have occasionally conversed with you in the wards, when (as often happens) some one has asked me what books he should read upon this or that disease, which has at the time been the subject of observation. In truth, I want to excuse you to yourselves from any misgivings you may have, that you are not doing all you might for your own information, when you are *not* reading about every disease you see; for I am persuaded of nothing more certainly than this, that there is a previous necessity of disciplining our own mind by an independent course of observation, in order to fit it for any thing like profitable instruction by the teaching of other minds, or, indeed, to furnish us with any tolerable security against being deceived instead of being taught.

They only who are practically informed can read good books with profit, or bad books without injury.

But still the literature of our profession, in its direct bearing upon practice, is a matter of the highest concern to you all. It is true that you cannot make any great acquisitions in it at present, but you ought to begin even now; not by running from this writer to that for a scantling of knowledge concerning each particular disease as it presents itself, but by seeking an acquaintance with those great writers who hold the keys to the just knowledge of all diseases, and the just administration of all remedies. Simultaneously with the observation of cases in the wards of the hospital, you must begin to learn the nature of morbid processes; and the study of these, and the observation of symptoms, begun together in this place, must never be separated in your minds as long as you live.

Hitherto I have spoken of books generally only, and as they may chance to fall in the way of the student; but now I would lead you to view a little more closely the character of medical literature in its bearing upon practice, in order that you may judge whether mine is reasonable and sound advice, when I desire you to direct your studies to that part of it especially which is pathological.

Practical medical literature may be divided into that which is purely the result and product of observation of the living body, and that which is the joint work of such observation and of research into the nature of morbid processes.

I speak of that only as literature, whether ancient or modern, which is generally known and used and referred to, and has thus become classical by common consent. The part of medical literature bearing this character, which is purely the growth of observation, has many times struck me with wonder. For when I see that observation, exercised upon mere signs and external things, has so assorted and arranged them, so ascertained their import and described their succession, as if it possessed an insight into the inward processes out of which they arise, yet really possessing none; and when I see that, still guided by mere signs and external things, it has often given to powerful remedies the safest and the best direction; and that, concerning the event of diseases and the issues of life and death, it has been able to see clearly, and discriminate nicely, and prognosticate truly,—I feel assured, that from the records of practical medicine may be adduced the highest instances of human sagacity and prudence. I have lately been turning over the Prænotions of Hippocrates, and the Epidemics of Sydenham, and this is the impression they have left upon my mind, concerning a class of writers of which they are pre-eminently the chief.

This part of medical literature, with which pure observation is conversant, receives few accessions from time to time; and this will hardly seem strange, when it is recollected that the same, or nearly the same, things which we now observe, have been observed by others, with the purpose of turning them to the same account, for more than two thousand years. The field of observation was well cultivated at an early period, and few names stand forth in any particular age, at subsequent periods, who have been really eminent in this department; and these have become fewer and fewer as the world has grown older.

Now, when I desire you to reserve the study and perusal of these writers for some future period, even until the time arrive when you have taken the treatment of diseases upon yourselves, do not conceive me to intimate that they are above the reach of your abilities. The truth is, that at present you have to learn their *language*. I do not mean the language of their words and phrases; these, indeed, are common words and phrases, but they intend something beyond the common meaning.

This meaning you can only gradually pick up, by living in the same region where they lived—by seeing the same things, and conversing with the same objects, that they were conversant with. This region is the region of observation; and they who live in it, and they who live out of it, cannot understand each other. They can construe each other's phrases, but they have a very dark apprehension of each other's meaning.

Do not imagine that I am forming an exaggerated estimate of this class of writers, because you do not *now* hear of their being much read by medical men at any period of life. I know they are not much read, and I will tell you why: it is because the majority of medical men have no real love for the practical part of their profession. It is a labour to them to observe; therefore they are no observers. They cannot see clearly what they must strain their eyes to see at all; and I will tell you the reason of this also: it is because when they were students (pray take warning from what I say) medical practice was unpopular, and they never attended to it; and they never were able in after-life to learn what they ought to have learnt in their youth. Their very faculty of observing was sound asleep when it should have been wide awake, and it could never afterwards be roused to discern more than the most obvious forms of things. No wonder, then, that the highest excellence in this same department of observation should have found few to appreciate it, and few to admire it.

But I hope better things from you. Only be diligent, and, at your time of life, and in so vast a field as this hospital, the very use and exercise of observation will naturally produce a taste and tact for observing; and then whatever you see in after-life you will see with profit, and draw sound experience from it; and not only so, but you will find yourselves of kindred minds with the great masters of our art,—reading them, relishing them, and improving by them.

But there is another part of practical medical literature, viz. that which is the joint work of observation and of research into the nature of morbid processes — in a word, the pathological.

Observation, and mere observation, had been at work for ages, and the extent to which it had penetrated into the nature of diseases does, I confess, appear to me quite wonderful. But it could go no further alone; and it was obvious that, if diseases were ever to be better understood and better treated, observation must be aided by some new method of inquiry. That new method, in the course of time, was introduced, and is now popularly employed; it consists of research into morbid function and morbid structure, and is based upon the knowledge of healthy function and healthy structure. It is pathology founded upon physiology.

By the combination of these two methods, observation of symptoms, and a rigid research into the nature of morbid processes, the face of practical medicine has been completely changed, even in our day.

The advantage which the physician now has over the physician of old is this: he has the same observation to guide him, and he has, moreover, a previous knowledge of the real condition of things, from which the immediate objects of observation derive themselves; and, coming to his work of observation with that previous knowledge, he is able to make observation itself go as far again as it would go alone.

The fever, the cough, the sputa, the laborious breathing, the wasting of the flesh — these are the immediate objects of clinical observation, and they at all times intimated fearful things to the physician of old, concerning diseases of the lungs. But effusions and congestions, and softening and hardening, and tubercles and vomicæ — these are the real things from which the fever, the cough, the sputa, the laborious breathing, and the wasting of the flesh, all derive themselves; and the physician now knows them all, and what they are in their origin, in their progress, in their termination, and which are capable of reparation and which are not; and, knowing what they are, he has taxed his observation for the detection of them in the living man; and, having detected them, he has further taxed his skill for a more exact application of remedies for their cure. And unquestionably he has often succeeded, both in detecting and curing, by the aids of this knowledge, what would have gone undetected and uncured if he had still worked by clinical observation alone.

Every day I go round the wards with you, I talk of things which must be quite unintelligible, if you are ignorant of morbid processes. There are forms of symptoms I am perpetually pointing out, which cannot be estimated except in their exact connexion with certain forms of disease previously understood. All the principal changes of structure which the lungs or the heart are capable of undergoing, must be well understood before you can appreciate any of the signs derived from auscultation or percussion. You may listen to the chest for ever and be no wiser, if you do not previously know what it is you are to hear. You may beat the chest for ever, and all in vain, unless you know what it is that is capable of rendering it now dull and now resonant.

The aid derived to practice from a knowledge of the means and agencies by which the disease is carried on is not always the same; but still there are few cases in which it does not contribute either to enlarge, or refine, or verify our observation, and to direct our treatment with a surer aim.

But this knowledge is not to be learned only in the wards of a hospital, or in any one particular way. The sources of it are various, and so too are the methods of obtaining it: lectures, books, museums, dissecting rooms, and experiments upon the living or the dead body. It is conversant for the most part with demonstrable objects, which are capable of being measured, and weighed, and delineated. It is beginning to take the form of a science, and to be governed by certain rules.

In as many places, then, and in as many ways as it is capable of being learned, you are at liberty to learn it.

And, howsoever and wheresoever you learn it, you must bring it with you into the wards of the hospital; and your observation will there breathe a spirit into it and apply it to its proper use.

Thus an acquaintance with the means and agencies by which disease is carried on will give greater effect and certainty to clinical observation, each testing and confirming the truths of the other, and both working together to the same end and producing a surer diagnosis and a safer treatment.

Such are the things which I have now called you to together to communicate; and, simple as they really are, they have cost me some thought; and it is with some feeling of responsibility that I offer them, when I reflect that the advice which I am giving you now, at the entrance of your practical studies, according as it is good or bad, may lead or mislead you for life.

It is a matter of no trifling concern to the well-disposed student, that he should be put in the right way of using his own observation, and that he should be well aware of all the means which are calculated to aid or hinder him in his task.

With respect to the taking of cases, which is one chief mode in which the observation is exercised, I have advised that the student should not begin to take them too early, and before he has got a clear notion of the great cardinal symptoms which are the guides to diagnosis and treatment: yet that he should not begin to take them too late; that, after he understands the import of symptoms, he should not allow his mind to rest too long in the abstract contemplation of them, but apply his knowledge to its use and exercise upon particular instances.

With respect to books, which are the chief aids or the chief hinderances to clinical observation, I have told him what he must read with caution, and what he must not read at all; what he cannot read *now* without an injurious bias, but may read hereafter with profit; and what he may read *now* without harm, but hereafter with more certain advantage. But, of all books and all studies, those, I have told him, are best calculated to promote the business of clinical observation which are especially conversant with the nature of morbid processes.

Medicine thus pursued begins to assume the form of a science. We call it pathology.

Now pathology is a study for your whole life. But it must be begun here, and it is important that it should be begun in the right way; and I am interested in seeing that it is so, because every right notion of pathology will be a great assistance to you in the acquisition of that knowledge which is to be gained in the wards of the hospital, and every wrong notion a serious hinderance.

LECTURE IV.

PATHOLOGY. — WHAT ARE ITS ELEMENTS. — HOW ANATOMY CONTRIBUTES TOWARDS IT — HOW CHEMISTRY — HOW EXPERIMENT — HOW CLINICAL OBSERVATION. — ILLUSTRATIVE INSTANCES IN ACUTE INFLAMMATION OF THE LARYNX — IN DISORDERED CONDITIONS OF THE URINE — OF THE BLOOD. — DR. PROUT. — DR. STEVENS. — THE KNOWLEDGE OF LOCAL MORBID PROCESSES ONE ELEMENT OF PATHOLOGY. — INFLAMMATION. — ITS VAST EXTENT AS AN OBJECT OF INQUIRY. — ITS GENERAL LAWS. — ITS MODIFICATIONS IN DIFFERENT STRUCTURES. — SPECIFIC DISEASES. — SCROFULA. — CANCER, ETC. — DROPSY. — SPONTANEOUS HÆMORRHAGE. — SURGERY PROPERLY INTRODUCTORY TO MEDICINE IN THE ORDER OF PURSUIT. — A RECOMMENDATION TO STUDY DISEASES OF THE EYE.

WHAT is pathology? It would seem to imply whatever, either of discourse or reasoning, has any reference to diseases. But this is much too large and loose an acceptation; yet I cannot determine the exact compass of its meaning, so as to bring it within the limits of a definition.

For popular uses it is often well to lean to the popular sense; and the popular sense regards pathology as conversant with *explaining* the phenomena of diseases, not merely with *observing* them. This is just an intimation of the truth. But we must take a nearer view of the matter, and guard against any mode of expression which may betray us into error at our setting out.

True it is that pathology is "conversant with explaining the phenomena of diseases, not merely with observing them." But it is also true that, without observation of the living body, there can be no pathology. Observation needs certain helps to give it a pathological aim; but these are only subordinate; and it still belongs to observation to concentre all that they are capable of teaching in the real knowledge of disease.

This should be clearly understood. Observation, working by itself, was able to win from the waste a large field, and to bring it into cultivation, and to reap from it a wonderful harvest. But the cultivation was expended upon the surface, and did not go deep enough into the soil.

When anatomy betook itself to investigate morbid structures, and chemistry to analyse morbid fluids, and experiments of various kinds upon the animal body pushed their researches in their several ways, a number of new facts were brought to light; and diligent men made an inventory of them, and clear-sighted men gave them an order and arrangement. But neither was *this* pathology.

The truth is, that not one of these, taken separately, can arrogate to itself the name and character of pathological; but all taken together, and brought within the sphere of mutual illustration, furnish the full amount of our knowledge concerning the nature of diseases. Therefore, whatever is learned by dissection, concerning forms and structures; whatever by chemistry, concerning elementary constituents; whatever by experiment, concerning the appearance and behaviour of parts and organs, under any new conditions in which they are artificially placed; and, finally, whatever is learned concerning the actings and sufferings of disease in the living man; all these, in their sum and aggregate, must be deemed to constitute one pathology.

Now, believe me, you are never *more* engaged in studies strictly pathological than when you are busied about the sick in the wards of the hospital; when you are observing external signs, indeed, but seeking to penetrate beyond them, and endeavouring, through them, to come at the actual procedure of the disease itself. And believe me, also, that you are never *less* employed in pathological studies than when you are dissecting, or analysing, or experimenting, if the facts thereby adduced are suffered by you to remain inert and useless, and dead, and are not delivered over to the observation, that it may turn them to good account.

Anatomy, and chemistry, and experiment, by their own authentic facts, are most necessary guides and safe-guards to the knowledge of disease by observation of the living body. But these have not so much enabled observation to enlarge its proper territory, as to penetrate deeper into the same soil.

I have seen a man, young, and full of flesh, and with the form and plumpness of health, laid out dead. And I have scrutinized all his organs thoroughly and carefully; and all were healthy and perfect, save the margin of that little chink which conducts to the larynx. And here there was a slight swelling, partly of the membrane which invests it, and partly of the cellular substance beneath; but there was no ulceration, no breach of surface.

And could *this* occasion death? Why, there was hardly a perceptible narrowing of the passage. And could this, I say, produce death? Yes! indeed could it. Truly this little swelling is a mighty disease. In two short days it had subdued and annihilated this very man. Not all the force of remedies, or all the vigour of his own frame, could save him. I had seen him with all his might fighting for breath, but in vain, for he died strangled.

But whence do we chiefly learn the pathology of this disease? In the corpse, or in the living man? Why did the little lymph and serum *here* effused become a fatal mischief? The corpse did not, and could not, tell us. For any thing it disclosed, he might still have lived; for after death the glottis was open, and air was made to pass freely through it to the lungs.

But what the corpse could not teach, the acting and suffering of the living man declared intelligibly enough. He spoke, and coughed, and breathed hardly and convulsively, and in an agony, and with a loud scream, or croupy noise; and he could not swallow. At length, voice, and cough, and breath, were all suppressed, and he died.

After death the glottis was open; but what was its state during life? Unquestionably it was greatly narrowed, or nearly closed; all that the patient did or suffered gave proof of the fact.

But what *can* narrow the glottis, if it be not narrowed mechanically? Surely nothing but the *vital* action of its own muscles.

Behold, then, the whole pathology of the disease! Those tiny muscles, which move the arytenoid cartilages and the vocal cords, could not bear the contiguity of the disease of the mucous membrane. It irritated them into a mighty spasm, which no effort of the will, no struggle of the whole body, could arrest or control; and, acting beyond their natural sphere, they dragged into a forced approximation every part which they could move, and nearly closed the glottis.

Here is a disease of which the pathology is complete, and so clearly and intelligibly made out by dissection of the dead and observation of the living body, that it would not be difficult to assign exactly how much is due to one and how much to the other. The material change of structure, in its kind, its seat, and extent, is disclosed by dissection after death. This is the point of departure for the whole disease, and small enough it seems. But the disease, in all its magnitude and terror, and the very means and agents of its peril and fatality, become known by observation of the living body.

It is useful sometimes thus to analyse the sources of our knowledge, that we may apply to the same in fuller confidence when we desire its increase.

But I have not done with this beautiful instance, which has exhibited a perfect piece of pathology, as the conjoint work of clinical observation and of dissection. I will still make use of the same instance — this acute inflammation of the larynx, — in order further to exhibit to you how pathology can add new and wonderful resources to practical medicine.

As I was going round the hospital one morning, a dying woman was carried in and laid upon a bed. What a frightful picture she was! Cold, and livid, and pulseless; her eyes starting from their sockets; her mouth wide open, and lips, and tongue, and teeth, black with sordes; and breathing convulsively, and with a kind of scream. With what agony she struggled for life! and what force she used to preserve it! Tossing about her arms, striking aside all who came near, for they kept the air from her; and dashing away a cup of water that was offered, for she knew a single drop would suffocate her.

What was to be done? All I could learn was that a few days ago the woman was well. She got wet; and in consequence she had sore throat and hoarseness. She had been bled, without relief. Symptom after symptom arose rapidly and uncontrollably, until they reached their present awful consummation.

This was quite enough to know. I ordered her trachea to be opened. Mr. Earle was at hand, and did the operation at once. The relief was complete, and she sank into a calm slumber.

For two weeks she breathed through the wound entirely; then partly through the wound, as it began to heal, and partly through the glottis, her voice beginning gradually to return. At the end of three weeks she breathed entirely through the glottis, and in six weeks she was discharged well. I have twice since, at distant intervals, met her in the street, and she has recognised me with a smile.

Now, do you ask what it was that called for the use of this extraordinary measure, and what was the manner of its success? Revert to the pathology of the disease, and you will see.

The disease was acute inflammation of the glottis. But dissection finds nothing in inflammation of the glottis which is *peculiar*. Dissection does not discover why it is not just as curable as inflammation of any other organ. But recollect, not more than half its pathology can be learned by dissection. For the rest, we look to clinical observation; and clinical observation teaches, that all that is peculiar and intractable in inflammation of the glottis is derived, not from its own nature, but from the part it occupies. In its own nature it is as curable as inflammation of any other part; but the glottis, from its essential irritability, will not suffer inflammation to abide upon it long enough to go through the process of a cure. The muscles of the larynx, if they must act, will *now* act convulsively; and act they must; for the larynx is an organ of perpetual and vital use, and in that use the muscles are engaged.

Hence the necessity of placing this organ under some artificial condition, which would enable the constitution to dispense with its use for a time. This is effected by opening a new passage for air through the trachea into the lungs, whereby the larynx is left at rest, and its inflammation brought within the same possibility of cure as that of other parts.

Thus we have seen how clinical observation, guided by a well ascertained anatomical fact, was able to concentre a complicated series of morbid actions and sufferings in one point, and arrive at a consistent pathological result. And we have seen, also, how that result, leading to a new and successful method of treatment, obtained thereby the best confirmation of its truth.

In like manner, chemistry, by giving the aid of its authentic facts to clinical observation, has led the way to large and consistent views of pathology, which *alone* it could not have enabled us to reach. In the hands of Dr. Prout, chemistry has become a key to pathology. As a chemist, he has pushed the analysis of the constituents of unhealthy urine much further than his predecessors. As a physician, he has turned both their discoveries and his own more largely and successfully to the uses of pathology. While he has given his own peculiar skill and genius to the work of chemical analysis, he has still adhered closely to clinical observation; and thus he has detected, in the disordered actions of different parts, and of the constitution at large, a manifest pathological alliance with the morbid products of the kidneys.

Read his chapters, especially upon "The Lithic Acid Diathesis," and upon "The Phosphatic or Earthy Diathesis," and you will see, not only how the characteristic constituents of the urine in the one are opposed to those in the other, but that the lithates have a peculiar kind of constitution to which they are allied, and peculiar forms of disease with which they are apt to be accompanied; and so have the earthy phosphates; and that these are as much contrasted with each other as the characteristic constituents of the urine itself.

I recommend Dr. Prout's book upon Diseases of the Urinary Organs to you, for the sake of the important information which it contains; and, moreover, as the best specimen of that method of philosophizing which medicine requires and admits. For if we consider the peculiar place which medicine holds as a department of knowledge, and how many things may be made to bear upon it which seem hardly to belong to it, no work can be too much prized which will teach us how to reason upon medical subjects, and especially how to unite the conclusions of any demonstrative experiment with the results of clinical observation, so as to render them both subservient to an explanation of diseases.

When we speak most modestly of medicine, we call it nothing more than a conjectural art. But this conjectural art so closely borders upon the neighbourhood of the sciences, and draws so much from their principles and discoveries, that we may be pardoned for sometimes calling it, and even believing it to be, itself a science.

Dr. Stevens, by experiment as a chemist, found that there was a condition of the blood in which it lost its due proportion of water, and its due proportion of neutral salts, especially common salt. And Dr. Stevens, by observation as a physician, learned that this condition of the blood was associated with the malignant symptoms of yellow fever. The contemplation of these facts led his mind to the employment of a new practice, the object of which was to give back its defective ingredients to the blood by the administration of salt and water; and thus he succeeded in curing an enormous proportion of those who, by any other method of treatment previously known, would have been thought incurable.

Here chemical experiment and clinical observation, leading (as it were) each other by the hand, proceed together, and arrive at the seminal principle of the disease. Passing by this organ and that, and this function and that secretion, they penetrate to the spring and source of all, even to the blood itself, and *there* they find it, and apply a remedy which is able to reach it *there*.

Truly these things are calculated forcibly to arrest the attention of every philosophical physician. Are we upon the verge of a great pathological discovery? We know how much belongs in common to all diseases called febrile. Dare we presage that the worst, and hitherto most fatal symptoms of all fevers, will soon be shown to have one origin? that a pravity, or deficiency in the constituents of the blood, is the cause? that this is demonstrable? and that it is remediable by the simplest means, which are always at hand?

Thus far I have endeavoured, by suitable instances, to show you the elements of pathological knowledge in actual operation, and how they work their way to the rational explication of the disease, and to the successful remedy.

But these elements must be possessed before they can be used. And, besides what results from clinical observation, which is one element, there are others which, you have seen, are supplied by anatomy, and chemistry, and experiment; and by these means you must acquire them, or by the instruction of those who already understand them.

I must presume that you are already tolerably acquainted with the structure and functions of the body in its healthy state; for otherwise you have a slender chance of comprehending its diseased conditions. The same blood-vessels, the same absorbents, and the same nerves, which are the agents of health, are also the agents of disease. The blood-vessels supply the pabulum by which the whole body and all its parts live and grow and perform their natural functions, and the blood-vessels also supply the pabulum from which every morbid structure and every morbid secretion is furnished and maintained. The absorbents bring in from without whatever is capable of assimilation and conversion into blood; and thus furnishing the materials by which the blood itself lives, they become, in the first and highest sense, the very springs and fountains of the body's nourishment. But the absorbents, which have assigned to them the process of ulceration in all its degrees and extent, become also, in an especial manner, the instruments of the body's destruction. The nerves impart pleasure, and the nerves impart pain. They regulate motion according to the will, and they withdraw it from the dominion of the will, rendering it convulsive and disorderly. Thus are the conditions of health made to give place to the conditions of disease by the instrumentality of the same agents, but by other modes of action.

You must seek to understand these things. As soon as you enter upon the business of clinical observation, you must have some right conception of them, if you would observe usefully; and ever afterwards, while your practical experience increases, you must take care that your knowledge of morbid actions keeps pace with it; that as your views become enlarged, they may be still precise, still *pathological.*

A discouragement often attends the first inquiry into morbid actions, from a belief that they are, in their very nature, so irregular that no clear notion can be obtained concerning them.

But, although morbid actions, in comparison with healthy ones, may be called irregular, they are not irregular in themselves, but capable of being reduced to laws, and conversant with principles.

For this reason, your inquiry into the nature of morbid processes should be careful and wary at every step. For here, if any where in the whole range of your professional studies, you must clearly understand each particular as you proceed, until you reach the point at which you discern the proof of a general law, and from that point you will advance rapidly and agreeably into a larger field.

Now the study of morbid processes begins with inflammation. And even popular opinion has learned to associate many portentous things with the notion of inflammation. And justly, because the world finds us perpetually talking about it, and perpetually dreading it. Practically, inflammation is never absent from the minds of medical men. Wherever an organ labours, wherever there is pain, the first practical question which we seek to determine is, whether there be inflammation present.

Inflammation is unquestionably the most capacious of all medical subjects; and fortunately it is that to which the best minds of our profession have been especially directed; and, more fortunately still, which they have best succeeded in illustrating. We are, therefore, sure of the best guides to assist us in the knowledge of it.

And since the knowledge of inflammation consists in great part of demonstrable facts, it is the more valuable on account of its certainty. And, moreover, since it is in a peculiar manner fundamental of almost all other knowledge in pathology, it is manifestly indispensable.

You must study inflammation as if it were a subject of rigid philosophy, carefully and patiently, and with the purpose of understanding every stage and step of it as you go along.

In inflammation there are numerous processes included; these may either be considered as parts and parcels of one inflammation, or some only as properly constituting the inflammation, and the rest as its products or consequences.

There is the *vascularity*, in which the blood-vessels act an important part within themselves prior to any change in the condition of parts without.

There is the *effusion*, in which the contents of the blood-vessels escape into the surrounding textures; these are serum, or lymph, or blood.

There is the *suppuration*, in which a new and peculiar fluid is formed.

And, coincident with these processes, there are adhesion, ulceration, granulation, gangrene. Of which some are destructive and some reparatory.

Now the several processes have their own physical conditions, which separate them from each other. And thus they require a separate study; by which you may know the very channels and agents of each according to its kind, and what the arteries, what the veins, what the absorbents do, and what the nerves.

But there is nevertheless a strict physical alliance between them; and, therefore, they must also be studied collectively. One does not merely precede the other, but naturally conduces to it; another does not merely follow, but naturally germinates from, its antecedent.

But there is no such thing as inflammation in the abstract. It must belong to some part or structure. Yet, as soon as you begin to contemplate it in one structure, you must not imagine that you are to find it in all other structures strictly the same. It is the same in kind; but it has different forms and modifications, according to the part it occupies. You may first study inflammation in the subcutaneous cellular membrane. I would advise you to do so, because here it exhibits the plainest example of itself, and all the processes which it includes here display themselves prominently and in a regular succession. But beware of calculating the progress of inflammation in the brain, the lungs, or the spleen, by what you have seen of it in the subcutaneous cellular membrane. What in this case is the commonest process of inflammation, viz. suppuration and abscess, those organs very seldom admit.

Some or other of the processes enumerated occur in all organized tissues, whenever they are inflamed. But different organs are more ready (if I may so say) to accept this and to refuse that, as they are induced by peculiarities of their own structure. Perhaps there are no two organs of the body which exhibit inflammation under exactly the same aspect, and the variety is owing (as far as we know) either to the different tissues of which they are composed, or to a different arrangement of the same tissues.

Consider, then, that concerning inflammation you have two great objects of inquiry. The first embraces what it is in itself, the rationale of its several processes, and the general laws which govern it, wheresoever it is found. The next embraces what it is under all the modifications with which it is capable of being impressed by the various structures and organs which it occupies, its general laws still remaining inviolate — what it is in the brain and spinal marrow, in the lungs and in the heart, in the liver and spleen, in the complex structure of the joints, in every coat of an artery, in every vestment and membrane of the eye, and in the walls and marrow of the bones.

But this immense subject of inflammation, in all its details, surely cannot be mastered by the student during the brief period of his pupilage.

Nevertheless he may make his entrance upon it, and may proceed so far in it as to reach some just conception of its general laws. Besides, now is the time when he has peculiar helps at hand which will enable him to prosecute the inquiry in the right way. What these helps are, I will tell you presently.

Thus the knowledge of inflammation may be regarded as the ground-work of all pathology. It is the commonest as well as the most comprehensive of morbid actions. I call it *common*, because it seems to arise inevitably in every man and in any part of the body under certain circumstances; you may even produce it at will.

Besides inflammation, there are other morbid actions, the processes and products of which require your study. These are not *common*, in the sense which has been just explained. Scrofula, or cancer, or fungus, or hydatid cysts, cannot be produced at will; neither are they incident to all bodies; neither do they inevitably result from any known conditions. These diseases are called *specific*, as contradistinguished from inflammation, which is *common*.

Concerning specific diseases, we have not the same amount or the same certainty of knowledge that we have concerning inflammation. We have a large inventory of facts, but not a clear insight into the general laws which influence their production; and knowledge, as long as it falls short of this, is still uncertain and precarious.

Besides these, there are certain other diseases which require to be studied in the very processes out of which they arise. They are not so mysterious as specific diseases, and yet not so *common*, or so well understood, as inflammation. Many conditions of their production we profess to be acquainted with; but still we cannot produce them at will. Dropsies and hæmorrhages are of the class I mean. Each of them is a very large subject.

I have been speaking of all these diseases — of inflammation, and dropsies, and hæmorrhages, of scrofula, cancer, &c. — as *local;* that is, as having a place and locality in which the special morbid processes of each are carried on; for it is to such processes that I desire now to direct your attention, the knowledge of them being one of the elements of pathological medicine.

Not that each has not more belonging to it than its local process which deserves inquiry — some disorder of parts remote, or of the general system, out of which it may primarily arise. But, however this may be, they none of them, whether inflammation, or dropsy, or hæmorrhage, or scrofula, or cancer, have any *demonstrable* existence, until they declare themselves by modes of action and modes of suffering, *in the part*, which are beside the uses and conditions of health; by something added to, or something deducted from, or some change wrought upon, its constituent structures.

Now I have told you, that, during your pupilage, and at this Hospital, you have peculiar helps, enabling you to make a successful beginning in this element of pathology, the knowledge of local morbid processes. You have lectures both medical and surgical. Of surgical lectures, a large portion is always occupied in describing and explaining the processes of inflammation, and in illustrating them as the results of injury, or accident, or disease, in parts and organs which fall within the special province of the surgeon. The medical lectures, also, are largely explanatory of inflammation, what course it takes, and what termination it has in different internal organs; how this course and termination vary in serous, in mucous, and in fibrous membranes; how in the pleura, the pericardium, and the peritoneum, they are of one sort; in the lining of the trachea and bronchi, stomach and bowels, bladder and urethra, of another; and still of another in the dura mater and pericranium; and how each circumscribed viscus of the body shapes and qualifies its inflammation in its own manner, and to a particular end.

Concerning dropsies, besides their remote cause, medical lectures dwell upon their cause *in the part*, or the very process of the effusion; and show why one organ or structure should more readily accept it than another.

The subject of hæmorrhage — I mean that hæmorrhage which is independent of injury or accident from without — is laid before you in the same lectures; and the process of its production shown, as it occurs in the brain, in the bronchi and lungs, in the stomach and bowels, in the kidneys, bladder, and uterus.

Of specific diseases, take cancer and scrofula as examples from among many which bear different names, and are formed (perhaps) by different processes. These are diseases with which both medicine and surgery are equally concerned; and the teachers of each have most curious and interesting information to give respecting their growth, by a well-defined succession of morbid processes. Of cancer, the female breast and uterus, and the stomach, are the most frequent seats, while hardly any part is exempt from a liability to it. Of scrofula all parts are the seat. It is enough to say, that it is the essence of that all-pervading disease, pulmonary consumption, in order to engage every one who intends to practise physic in the endeavour to learn all that is known about it.

Concerning these several orders of disease, inflammation, dropsy, and hæmorrhage, and specific complaints such as cancer and scrofula, let me further add, that, besides the study of each as it is in itself, in its own morbid process, there is a study of them also in combination, which belongs to the knowledge of pathology; for they occur as frequently in combination as alone, one process running into another, or one process exciting other processes all around it. Thus inflammation will run into dropsy or hæmorrhage; and it will be so blended with scrofula, as to be called *scrofulous inflammation.* Cancer can hardly reach its fatal consummation without inflammation and hæmorrhage; and scrofulous tubercles of the lungs often excite at the same time inflammation of the surrounding pulmonary structure, hæmorrhage from the bronchi, and dropsy into the cavity of the pleura.

You really must have some correct notion concerning all these things before you can derive the profit which you ought from clinical observation; and, as I know you cannot go through a laborious investigation of them at present in all their accurate detail, I must refer you to the sources of information nearest at hand. I must advise you, for you have all attended medical, and most of you surgical, lectures, and have taken and preserved your own notes of them, — I must advise you, to review all those parts of such lectures which expressly treat of morbid processes. Those of you who are already conversant with surgical practice will do well constantly to bear in mind what you have seen upon the exterior of the body. You will find it of daily use in every medical case you observe. Processes of disease within and without the body are of the same essence. Their forms only are influenced by structure, and are different in different parts.

Unquestionably, there is no better introduction to the practice of physic than the practice of surgery. It is a course which I strenuously recommend to all those who have time to carry it into effect. The best and most highly instructed men feel the necessity of it, and do not shrink from it. I believe I am correct in saying, that of men educated at the universities, and then resorting to St. Bartholomew's Hospital with the view of becoming physicians, during the last sixteen years, there has hardly been an individual who has not gone through the entire business of a surgeon; not as a mere looker-on, but as a dresser, for as long a period as if he was to practise surgery all his life. I mention it to their honour; for an admirable race of physicians has been produced by this system. Thus it has become the established practice here for all who intend to be physicians to begin with surgery. Professor Haviland of Cambridge first brought the practice into fashion by his judicious advice to all within the sphere of his influence; and I have done all in my power to second the recommendation of my excellent friend. The benefit consists mainly in this, that it makes you familiar with the visible processes of disease and reparation while they are actually going on.

There is yet another recommendation which I would offer to you; and let it not seem a strange one, whether you are to be physicians or surgeons. If you desire to make pathological knowledge the ground-work of your credit and usefulness through life, let me advise you not to allow the period of your pupilage to pass by without making a special study of the diseases of the eye. Here you see almost all diseases in miniature; and, from the peculiar structure of the eye, you see them as through a glass; and you learn many of the little wonderful details in the nature of morbid processes, which, but for the observation of them in the eye, would not have been known at all. Let every one of you who has a few months to spare give them to the Eye Infirmary.

Now, after what has been stated, you will perhaps be ready to ask me, Whether it be indeed true, that all this sort of knowledge is required to fit a man to practise physic? and I will answer you honestly, That it is not required. Many a clever man practises physic with tolerable success, who has never troubled his head about morbid processes, and who has not the remotest notion how those things come to pass which he has been witnessing, in their effects or their symptoms, all the days of his life. A man may practise physic without it, but he cannot be a *first-rate* practitioner without it. In the treatment of diseases we often minister to the symptoms, and the symptoms only; but, in the treatment of diseases, we often minister partly to the symptoms, and partly to the very processes of the diseases themselves. This he only can do who knows what they are. Believe me, he who would be a first-rate practitioner must lay his foundations broad and deep in the knowledge of morbid processes; otherwise, although he may sometimes prognosticate truly concerning life and death, he can *never give* an accurate diagnosis concerning the nature of diseases of which he can understand nothing. Above all, he must never hope to benefit mankind by advancing the knowledge of his profession a single step.

LECTURE V.

ON THE PROPER OBJECTS OF MEDICAL INVESTIGATION. — WHAT MEDICAL FACTS ARE, AND WHAT THEY ARE NOT. — THE OBSERVATION AND COLLECTION OF FACTS. — THEIR ARRANGEMENT, ACCORDING TO ANALOGY OR RESEMBLANCE — ACCORDING TO THE RELATION OF CAUSE AND EFFECT. — WHAT IS MEANT BY THE RELATION OF CAUSE AND EFFECT BETWEEN MEDICAL FACTS. — PECULIAR DIFFICULTIES IN THE WAY OF ASCERTAINING THAT RELATION. — THE TASK OF ASCERTAINING IT NECESSARY TO OUR KNOWLEDGE OF THE SOURCES OF DISEASE — OF THE INFLUENCE OF REMEDIES — AND OF THE CONNECTION BETWEEN THE DISEASE AND ITS SYMPTOMS. — THE SOURCES OF DISEASE, HOW EASILY AND QUICKLY ASCERTAINED IN SOME INSTANCES — HOW TARDILY AND DIFFICULTLY IN OTHERS.—THE INFLUENCE OF REMEDIES, HOW LIABLE TO DECEPTION, FROM A VICIOUS CREDULITY ON THE ONE HAND, AND A VICIOUS INCREDULITY ON THE OTHER. — THE NATURE OF GENERAL PRINCIPLES IN MEDICINE, AND HOW THEY ARE REACHED.

CERTAIN observations which I formerly made* must be considered to comprise the *method* only in which the particulars of a case may be most conveniently surveyed: but more remains to be considered than the mere form of case-taking.

You may adopt this mode of case-taking, or any other which your own experience may make most convenient to you: but no method of recording the particular facts will be of any use to you, unless you have right notions concerning the *facts* themselves. The facts, in truth, *are* the case; and it is only for the sake of getting *sure* possession of them that we adopt any form of (what is technically called) case-taking.

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* Vide page 48.

Now the whole business of your lives will be the business of taking cases; not necessarily with pen, ink, and paper, or after any technical form. But still it will be the business of your lives really and essentially, and in the justest sense; for each case is made up of its own facts, and the facts alone must teach you the nature of the disease, and suggest the remedy in every patient you see. Therefore, as long as you live, you will be evermore conversant with facts; learning and collecting them, arranging and combining and separating them, tracing their relations, and through them arriving at general principles.

There are peculiar causes which will ever prevent medicine from arriving at the certainty of purely physical science. But in so far as it is *certain*, in so far as it has taken the form of a science at all, it is built upon the same foundation with all other sciences; namely, upon facts: and in so far as it is uncertain, beyond what, in its own nature, it ever need to have been; in so far as it has not deserved the name of a science, it is raised upon a foundation which never would have been deemed sufficient for any other department of human knowledge.

It is important, then, to the right judgment and the right treatment of every individual case that we see—it is important for the sake of preserving to medicine whatever claim it may have to the name of a science, and (I will add) for the sake of our own credit and satisfaction, that we should utterly reject all other foundation of professional knowledge except matters of fact.

I desire to convince you of this, by showing you, first of all, what matters of fact in medicine really are, and what they are not.

Every man's notion concerning any department of knowledge is the popular notion, until it is rectified by further inquiry. The popular notion concerning medicine is, that diseases are separate essences, and that an idea can be formed of them apart from the living being in whom they occur; that a fever, or a pleurisy, would still be something real, although there were no living beings in whom they could manifest themselves.

But diseases are not abstractions; they are (I have said) "modes of acting different from the ordinary and healthy modes — modes of disorganizing, modes of suffering, and modes of dying; and there must be a living, moving, sentient body for all this."

Endeavour to understand this truth; and at the very entrance of your professional studies get rid of all abstractions, that you may never record them and use them (as they are and have been recorded and used) as matters of fact.

You may record that this man has a hot skin, a dry tongue, and a frequent pulse, and call his disease a fever; that this man has a pain in his side, difficult breathing, and a hard pulse, and call his disease a pleurisy; but beware of taking this fever or this pleurisy for more than they really are. The fever is nothing, and the pleurisy is nothing, but the complex of the several facts which you have recorded under the head of each: separate from them, they are mere names. The fever has no treatment, and the pleurisy has no treatment, but what is suggested by the facts included under each. You prescribe for the hot skin, the dry tongue, and the frequent pulse, and you bring back their condition to what is natural, and so cure the fever; and you prescribe for the pain in the side, the difficult breathing, and the hard pulse, and so cure the pleurisy. But if, without regard to the facts apparent in the individual patients, you pretend to address your remedies to the fever *itself*, or the pleurisy *itself*, you take aim at an absolute phantom.

Bear in mind, then, that abstractions are *not facts;* and next bear in mind that *opinions* are not facts. To record that a patient is *better* to-day and *worse* to-morrow; that he is at one time doing *well* and at another doing *ill;* is to give a *summary opinion* upon the facts, not the *facts* themselves.

I do not mean to say that such summary opinions should not be formed, or that they should not be announced. We always *do* form them, and the patient, or the patient's friends, always require us to communicate them; and most justly. But to ourselves, and in communication with other medical men, either for the sake of marking the exact state of the disease or suggesting the remedy, they are utterly useless.

If, in going round the wards of the Hospital, I had it punctually recorded that this, that, and the other patient had a peritonitis, a nephritis, or a hepatitis; and that day after day this, that, and the other patient were better, worse, or just the same; and if, day after day, I were to order bleeding, blistering, or purging, as the case might require, and thus you were to witness numerous instances of recovery, you would not reap the slightest benefit from me and my pretended instruction, although you went round with me for a twelvemonth. For this would be to keep industriously from your notice every thing in the shape of a *fact* by which you could estimate the nature and progress of the disease, or the operation and effect of the remedy.

In medical science, the only materials of our knowledge are those things which are referable to our sensations and perceptions: matters of fact. Such are the temperature of the skin; the number and qualities of the pulse; the quantity and qualities of secretion; functions and modes of action in the several parts and organs of the body; and all their cognizable deviations from what is natural: also pain; for although pain, as to its actual occurrence in a particular case, must be taken upon the testimony of the sufferer, each man's own experience must sometime or other have convinced him that pain is a *fact*.

Such, too, are the conditions of parts discoverable after death; their increased or diminished bulk; the changes of structure and injuries they have undergone, and the morbid products to which they have given origin. These are the sort of facts with which we have to do, if we would know diseases and how to treat them.

Such being the materials of our knowledge, it becomes important to consider how we can use them best, and abuse them least; for the materials of our knowledge require to be hewn and squared, and fitted to their place, with much care, and skill, and diligence; otherwise, what might have been a seemly edifice may chance to be no better than a heap of rubbish.

First, then, as to the *simple reception* of medical facts, there is a good deal to be learned.

All facts are not of equal value: some are trivial and accidental, some important and essential to the subject. In your inquiries at the bed-side, you will have to select and to reject cautiously and discriminately. Patients themselves are apt to press upon their medical attendants symptoms (generally consisting of strange sensations) which are irrelevant to their present disease. Again: in your examinations by dissection, you will have to use much care, lest you should admit appearances as indicative of disease which are accidental, or may have arisen during the process of dissolution, or from the position of the body after death.

But in this sifting and separating of facts, be cautious of throwing away any thing that is really valuable. Beware of rejecting facts of which you do not, perhaps, comprehend the import, and because you do not comprehend it; but rather reject those which you *do* comprehend, and know them to be trivial. Be careful especially of not allowing their due weight to facts which appear contradictory to each other; rather examine them more scrupulously because they are so. For instance, a patient may have a severe pain in the side and a frightful dyspnœa, and the pain and the dyspnœa may have arisen suddenly. Such symptoms at once carry with them the suspicion of active inflammation, and our thoughts may immediately run upon copious bleeding. But the same patient may, in the mean time, have his skin cool, and his pulse soft and tranquil, and not more frequent than the pulse of health. Cases of this and of the like kind are not uncommon, in which symptoms of a contrary character neutralize the import of each other, disprove the suspected existence of a dangerous disease, and forbid the needless adoption of a severe remedy.

The more you exercise yourselves in the observation of medical facts, the more you will understand the sources of error to be avoided in the reception of them. Time and diligence, and constant intercourse with the sick, if you have but *an impartial and honest* mind, will enable you to lay up a large and useful store of genuine facts, and to draw from it as the treasury of your future knowledge.

I say an *impartial* and an *honest* mind, because it is remarkable how apt some little favourite theory is to get early possession of the student's imagination, rendering him dishonest (perhaps unconsciously) in the simple reception of facts. It is like some little favourite sin in our moral nature, which taints the character of the whole man.

A premature desire to generalize, an eagerness to arrive at conclusions, and a readiness to rest in them, are very common infirmities, and they offer very serious hinderances to the right acquisition of facts. For, if the early habit of theorising do not estrange the mind of the student from the wish to observe altogether, it may so pervert the faculty itself in its very use and exercise, that, be his wish what it may, he cannot observe honestly. He gives an undue weight to the facts which accord with his assumed principle, and no weight at all to those that conflict with it: habit forces him to do so, and he cannot help it.

A very good and wise man has explained this matter by an illustration, which is so beautiful and so true, that I must recite it to you: — "A watchmaker told me that a gentleman put an exquisite watch into his hands that went irregularly. It was as perfect a piece of work as was ever made. He took it to pieces and put it together again twenty times. No manner of defect was to be discovered, and yet the watch went intolerably. At last it struck him that the balance wheel might have been near a magnet. On applying a needle to it, he found his suspicions true: here was all the mischief. The steel work in the other parts of the watch had a perpetual influence on its motions; and the watch went as well as possible with a new wheel. If the soundest mind be *magnetized* by any predilection, it must act irregularly."*

In the reception of facts, then, it is essential, first, that they be fully ascertained — *i. e.* upon sufficient observation; 2dly, that they be fairly and honestly represented, without disguise, modification, or omission, to make them suit particular theories; 3dly, that they be important and essential to the subject — not trivial and merely incidental to it.

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* Cecil's Remains — on judging justly.

Next comes the arrangement of facts. Now, facts may be arranged according to certain characters of agreement observable between them. There is an agreement of analogy and an agreement of resemblance. *Analogy* is a loose sort of resemblance, in which points of agreement and points of difference are mixed up together. By separating twenty points in which they differ, and retaining the two or three in which they agree, multitudes of things may be brought into this loose kind of resemblance and classed together. Thus, *analogy* is enough to bring diseases together in the same nosological order, as Fevers. Then, again, by calculating what individuals of the general order have most points of agreement, and distinguishing them accordingly, we come to divide orders into genera; and by still further selecting the individuals of the genus which have most points of agreement, we find the species; and by dealing with the species in like manner, we may divide it again and again, until thus, from the relation of mere analogy, we reach that of a tolerably strict resemblance. This is the scheme upon which nosologies are constructed; and nosologies have their use, until we can arrive at something better. It is better to arrange facts according to the relation of analogies and resemblances, than not at all.

But it is far better still, if it be possible, to arrange them according to their natural sequences, *i. e.* according to the relation of cause and effect.

Now, "our knowledge of cause and effect, in reference to any two particular events, is founded entirely upon the observation of a uniform sequence of the events; or of the one following the other in a uniform manner in a great number of instances. The greater the number of instances is in which the sequence has taken place, with the greater confidence do we expect it to take place again under similar circumstances; and every single instance in which it does not occur weakens our confidence, unless we can discover some adequate cause by which the sequence was interrupted. The result of this confidence is, that when we observe the first of two such events, we expect the second to follow it; and that when we observe the second, we conclude the first has preceded it. The first we call cause, the second effect." *

The philosophical physician is evermore studying how, upon adequate grounds, he can assign to medical facts this relation. But he knows in how delicate and difficult a task he is engaged. He is obliged to wait upon experience, and to attend to phenomena as they happen to occur. He cannot bring them together at will, and vary and transpose them as he likes, so as to learn

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* Abercrombie; Intellectual Powers, 390.
Whoever is interested in following the right path of medical investigation, would do well to acquaint himself with that pointed out by Dr. Abercrombie. I recommend his book to the careful perusal of every student.

their connexion. He envies the ease with which the chemist can bring any substance within the sphere and influence of as many others as he pleases; and the accuracy with which he can then ascertain the degrees of affinity it bears severally to each, — an accuracy so precise, that he can express them by numbers.

Further: when the physician has ventured to draw such conclusions as his long observation seems to warrant, he cannot test their truth by any simple experiment. He has no litmus or turmeric paper to tell him whether the blood-vessels or the nerves are the prime agents in producing a certain form of fever; but what his long observation seems to have taught him, he must still wait for the same long observation to confirm or to confute.

Unfortunately for us, the nature of medical causation is such, that it takes as much time and trouble to rectify an error as to establish a truth. Thus it may require the experience of one man's life to arrive at some plausible theory, and the counter-experience of another man's life to show that it is false.

The vast experience required to establish a uniform sequence of events, and the impossibility of applying any summary test to the truth of our conclusions, are difficulties inseparable from the nature of medical causation. They lie at the very root of the matter.

And beside these, there are others, from sources impossible to enumerate, which perpetually beset and waylay our path of inquiry, breaking in upon the uniform sequence of events, and disappointing the best conclusions of experience. Such are the influences of places, and seasons, and climates; and the wills, feelings, and propensities, and all that is understood by the constitution, corporeal and mental, of human beings.

But however hard the task may be, we must still try to know the true relation of the things which concern the ordinary practice of our profession; we *must* trace the influence of external agents as causes of disease; otherwise we can do nothing for its prevention. We *must* trace the influence of external agents as remedies; otherwise we can do nothing for its cure. We *must* trace, too, the connexion between certain symptoms and certain morbid processes going on within; otherwise we can adopt no rational treatment of individual cases.

Respecting the external causes of disease, you must make them your study as opportunities may present themselves to you. But there are some so important, that their investigation has become of itself a department of medical education; I mean what is called "forensic medicine." And, indeed, I know no department of public teaching which, if it be entrusted to good hands (and I am sure it is so in this hospital), promises more benefit to medical science and medical practice than this. It undertakes to illustrate the modes in which injury, disease, or death, arrive from those external agents or accidents that are most signally hurtful to animal life; from poisons of every kind; from lightning; from hanging and drowning; from corruption of the air; and from every method of simple violence. Thus forensic medicine is conversant with all the highest points of physiology and pathology; and its very purpose requires the greatest exactness in the nature and display of its proofs. It requires, in truth, that they should be so made out as to be obvious to such understandings as ordinary men are accustomed to bring with them into a jury-box.

Here, then, is provision made, within a large and interesting field, for demonstrating to you the effects of external agents as the causes of disease; and all *matters of fact.*

The display of the fatal effects resulting from the causes enumerated to several vital parts and organs, furnishes so many demonstrations of the possible ways in which the same parts and organs are capable of suffering from causes less hurtful. Not long ago, poisoning was an affair of the utmost darkness and mystery; but now, the rationale of poisoning in its several kinds is so well made out, that I am able to refer to it for the best instances which pathology affords of cause and effect in the manifest influence of external agents and accidents for the production of disease.

Poisoning, and the severer injuries, are a sort of pathological experiments. They produce upon this or that organ all the phenomena which any conceivable disease can exhibit; and they produce them in the greatest simplicity, because the subject is often previously in a state of health. Thus it is that they furnish an admirable introduction to the study of what is called spontaneous disease in the same organs.

Very acute inflammations arising suddenly in a healthy body afford the *next best* instances of the effects of external agents as causes of disease. I am accustomed to regard them in the light of medical accidents; for although the inflammation come from no injury in the ordinary sense, yet it will generally be found to have followed the exposure of the body to influences which act with a kind of violence, — such as sudden changes of temperature, or the use of meats and drinks which, from their preposterous kind or quality, have become in a manner poisonous. Thus, the external cause productive of inflammation, and the time of its application, are sometimes as accurately determined as a fall or a blow.

In proportion as diseases are more chronic, they are, upon the whole, less easily assigned to their external exciting causes. With respect to them, a longer experience and inquiry are needed to establish a uniform sequence of the events. If you are attentive observers in the wards of this hospital, it will require a brief period only to convince you that the sudden impression of cold is among the undoubted causes of acute inflammation in various vital organs. But you cannot know that the habitual indulgence in spirituous liquors is undoubtedly productive of congestion of the liver until after years of experience. For the present, you must be content to take this fact upon trust from the testimony of others.

The questions of malaria, of contagion, and of animal poisons, the certainty of their influence as causes of disease, and the mode, the sphere, and condition of their operation, are all questions of the highest importance, and involving facts of great interest. But I would advise you not to meddle with these questions at present; for *at present* you can only do it *speculatively:* therefore it is better that you should wait until a sufficient number of facts have fallen under your notice, either to enable you to form some conclusions of your own upon these subjects, or to have a sound judgment of the conclusions which have been formed by others.

With respect to the influence of external agents as remedies, I would recommend you to be most jealously observant of every circumstance connected with the treatment of individual cases. A *mere sequence* of events is not a *necessary* sequence.

The remedy may be administered, and the disease may cease; and yet the treatment and the cure may not be cause and effect.

The remedy may have been really *inert*, and the spontaneous powers of reparation in the constitution or in the part may have been enough to surmount the disease; or the remedy may have been *active* in the wrong direction, and the powers of reparation more than enough to surmount the disease, — enough both to surmount the disease and to render the remedy harmless.

Your only safeguard against such deception lies in the most jealous and scrupulous observation at the bed-side. Turn your attention, first of all, to well-marked instances of disease which is acute and rapidly progressive, where the remedies must be of equal force with the disease, and must operate with equal rapidity, and from which, if a curative impression follows, it must be a *sensible* impression. Watch the treatment of inflammation in various vital organs by the different modes of bleeding, by calomel, by tartar emetic, by colchicum; and the treatment of certain convulsive and painful disorders, and certain forms of delirium, by opium.

Beware of mistaking the nature of the disease, and then believing that the remedy has cured what in fact never existed. I lately read a book in which a certain remedy was recommended as infallible for diseases by dozens; tic douloureux, ovarian dropsy, disorganisation of the heart, paralysis, and I don't know what besides, were all cured by it. Of these diseases no description was given, but only the name; so that there was not the slightest evidence that any such diseases existed as those that were said to be cured.

In like manner there have been remedies for cancer, remedies for consumption, remedies for stone, all owing their reputation to the nature of the disease being mistaken.

This is the field in which ignorance and imposture reap their golden harvests. Not that it is impossible for those of good intention and good information to mistake the character of a disease, and so ascribe an efficacy to a remedy which is not its own; but those have the best security against this error who have taken the most pains to acquire a habit of faithful and jealous observation.

But there is an opposite infirmity not uncommon among medical men, which is just as much to be deprecated as the easy credulity of which we have been speaking, — a scepticism in regard to the influence of medicine — a stubborn reluctance to admit the relation of cause and effect between remedy and cure. Surely it is not at all less hurtful to take up a notion that a number of diseases, from their nature or seat, are beyond the reach of all remedies, than to believe that any or every disease that gets well after the use of any remedy is necessarily cured by it. In the one case things are linked together as cause and effect, which bear no such relation; and in the other, things which really bear that relation are perversely dissevered.

Many men pride themselves upon this vicious scepticism, and wish to be thought to exercise a philosophical caution. Voltaire, who was upon the watch for every ludicrous infirmity of human character, was sharp enough to discern this in physicians, and has made excellent sport of it.

He makes a physician of renown come from Memphis to cure Zadig of a wound in his *left* eye. The physician, however, affirms it to be incurable, and predicts the very day on which Zadig is to lose his sight, regretting at the same time that the accident had not befallen the *right* instead of the left eye, for *then* he would have promised his cure; wounds of the *left* eye being in their very nature irremediable. But Zadig gets well; and the physician writes a book to prove that he ought nevertheless to have lost his sight.

But much better than the fiction of Voltaire, and very much more to the purpose is, what really happened, and stands authenticated in a Scotch law book. Three physicians and two surgeons made oath in a court of justice, that, "by the rules of their prognostics," the wounds received by one James Houston were mortal wounds. But James Houston was still alive; and, to the honour of the three physicians, the two surgeons, and "the rules of their prognostics," was plaintiff in the very process wherein they had so memorably deponed.*

With respect to symptoms and their connexion with morbid processes going on within, the subject is too extensive to allow me to enter upon it at present. Indeed, it is so extensive and so important, and so full of its own difficulties, and yet a subject wherein right views are so expedient, and wrong views so perilous, that I have thought it would not be altogether a profitless task either to you or to me, if we were to undertake together a patient and comprehensive examination of this very subject. Therefore, in connexion with the proper business of the wards, and the observation of cases, and (as I trust) for your help and my own, and for our mutual guidance at every step of our practical studies, I will endeavour, in a series of lectures, to give what illustration I am able to the doctrine of symptoms.

It remains that we notice another, and (philosophically considered) a higher purpose, which concerns us in the contemplation of medical facts — viz. the discovery of general principles from them.

A principle (as the name imports) is a beginning. A principle is some matter of fact to which numerous other matters of fact are traced as to a common source; and when we speak of discovering a principle, we mean the business of analyzing or decomposing compound matters of fact, into those which are simpler, until we come to one which is simpler still, and more general and elementary; and, being unable to go beyond it, we regard this as an ultimate fact, or a principle. A principle is an ultimate fact, and a universal fact; and true, without a single contradictory instance.

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* Edin. Med. and Surg. Journal, vol. i. p. 389.

Now it must be confessed that there is no fact in medicine (*i. e.* no fact respecting the animal body, its actions upon itself, or its obedience to other influences) which has the same character of universality with certain facts respecting the external world. In medicine we have no fact so universal as that all bodies unsupported fall to the ground, no principle so sure or irrefragable as gravitation.

Nevertheless, in medicine we talk of principles, and we are continually striving after them; but in the strict philosophical sense, have we ever really compassed them?

We have reached *forms* of principles (if I may so say) rather than principles themselves. By *forms* of principles I do not mean things fictitious, or things purely imaginary, but facts tested by observation, and carefully analyzed, and very comprehensive, but not universal: facts true in a vast number of instances, but not true in all.

In medicine there have, indeed, been facts, which for a time have passed for universal, and for a time have held the place of principles; but larger experience has shown that their title to it was not a just one.

There is a certain order of symptoms constituting what is called "angina pectoris;" and angina pectoris was for years, by the common consent of medical men, drawn from extensive observation and dissection, universally ascribed to ossification of the coronary arteries of the heart. But more enlarged experience has found angina pectoris to exist where there has been no such change of structure, but another form of disease, viz. dilatation of the origin of the aorta; and *still more* enlarged experience has found it where there has been neither one nor the other.

The disease produced by the vaccine virus gave proof, by instances almost innumerable, of imparting to the constitution a protective power against small-pox. Accordingly, this power was believed to be absolute and universal. At length contradictory instances arose and multiplied; and the protective power of vaccination was now no longer a law or a principle. In the present state of our experience we still ascribe to vaccination a protective power against small-pox, but one which is *only highly probable*, not certain. We ascribe to it, moreover, when its protective power fails, a mitigating power; but this, too, is only highly probable, not certain; for assuredly both its protective and its mitigating influence sometimes fails, and small-pox after vaccination sometimes goes through all its stages *unaltered*, and is in all respects the *same small-pox*, as when no vaccination has taken place.

After the history of vaccination we know not what number of concurrent instances is enough in medicine to prove a fact universal, or when we can ever be safe against the intervention of contradictory instances, and venture to rely upon any fact as a doctrine or a principle.

But we are not, therefore, to abandon our search after principles; and the same method which in other departments of natural knowledge has alone led to their discovery, we must still employ in ours; for although in our hands a less eminent success has hitherto attended this method, no success whatever has attended any other. This method imperatively requires that the principle sought be a matter of fact.

If, while we properly restrict ourselves to matters of fact in every other stage of our investigations we yet take a fiction for our principle, medicine will never improve as a science in our hands, and ancient errors and follies will only give way to new ones.

The fault of physicians has not so much been, that they have shown a general disregard of matters of fact, as that they have lost sight of them just when they ought especially to have kept them in view — when they were concerned with principles. Hence the mischiefs that have arisen to physic in the shape of so many renowned theories, either shown to be false, or not shown to be true. Take any of these false or unverified theories you please, and you will always find it derived from some principle gratuitously assumed, a principle which is either no matter of fact at all, or incapable of being shown to be a matter of fact.

The principle assumed may be some physical process or property, such as a spasm of the extreme vessels, or a peccant matter in the blood; things which possibly may be, but which are entirely without proof, and even too subtle to admit of any; possible facts, but facts quite unascertained and gratuitous.

Or the principle may be neither process nor property, nor any thing that has a physical existence, real or possible, but a mere figment of the mind. The Zoonomia of Dr. Darwin abounds in principles of this kind. Even Mr. Hunter, with all his wariness and penetration in search of truth, admits what he calls "the stimulus of necessity," as a principle or element engaged in the production of diseases before they are yet apparent in their phenomena. This is to escape from physical inquiry into the region of pure fancy.

What has been said of principles in medicine, whether erroneously or legitimately pursued, may seem to offer small encouragement to physicians to engage further in the search after them. Many of the most celebrated that have given renown to schools and universities have been abandoned altogether — abandoned because they have been erroneously pursued, and have not possessed the essential character of matters of fact. Many, again, being real matters of fact, and legitimately sought and accepted as principles for a time, have at length been abandoned, because they have been found not to possess the essential character of universality.

But we must still concern ourselves with principles; we cannot help it; all men do it in some sort or other; for the mind is not able constantly to keep in view all the particulars of its own experience. It must needs reduce them within a narrower compass, and contemplate them (so to speak) in some representative. Thus a law or a principle must be set up, right or wrong. Some forge a maxim, and some forge a fact, and soon find it conspicuously illustrated in every instance of disease they meet with. They find *irritation* in every thing, or *spasm* in every thing, or *bile* in every thing. While others, after having gone on observing and collecting facts, and cautiously arranging them according to their natural relations, venture at length to rest in one which seems to have every characteristic of a principle, and yet in process of time may turn out to be no principle at all: witness the protective power of vaccination.

The truth is, something must be conceded to physicians in respect of the very nature of the subject on which they are engaged. Let the principle be ever so legitimately reached, we are only answerable for it as a law explanatory of the facts *already known*. But in medicine new facts are continually presenting themselves. These may be still comprehended within the same principle, or they may not. If they are, they furnish a stronger attestation to its truth. If they are not, they weaken or destroy the principle altogether. But it is no disparagement to us that our principle has failed. We are only concerned that the method by which we reached it is the right one; and then, though it fail, we are at liberty to arrive at a new principle, if we are able, by the same method; that is, to find some other matter of fact comprehensive of the newly discovered particulars, and to concede to it the character of a principle.

Such is the nature of medicine, that things which we have laid up in our minds as settled truths often require to be modified by our future experience, and come at last to be rated many degrees below the value at which we originally prized them.

Nevertheless, we do not claim for medicine a liberty to transgress any of those landmarks which philosophy has set up to indicate the path of truth. Let it have no other principles, and no other method of arriving at them, but such as philosophy approves; only let no disparagement fall upon it (considering the nature of the things with which it is conversant), if, for just reasons, it be sometimes dissatisfied with principles which it once embraced, and seek to discover new ones.

Finally, then, as to general principles in medicine, let it be remembered that the mind must always seek to arrive at a matter of fact, and *there* only be content to take its rest. But it need not settle there longer than until the clear discernment of some other fact, more general and elementary, opens the way to a safe progression beyond it. Then the fact last discovered becomes the principle, and the other is only one of the several stages conducting to it.

In this mode of proceeding our knowledge may be *incomplete*, but it is never erroneous. The mind advances from fact to fact, resting on one as the stepping-stone to another, and feeling safe in the possession of the truth, although it may not be *all the truth* that is capable of being ascertained.

Every fact from which another fact is derived is in some sort a principle. To us it is a *first* principle as long as we are obliged to rest in it; but as soon as another fact is discovered which is prior to it, it loses its character of a *first* principle; and, if it be a principle at all, it is only an *intermediate* one, the first being always that to which we know nothing prior.

LECTURE VI.

ON THE DOCTRINE OF SYMPTOMS.

GENERAL NOTION OF SYMPTOMS. — HOW THEY DIFFER FROM MERE SIGNS. — THE RELATION OF SYMPTOMS TO DISEASES NOT THE SAME IN ALL CASES. — SYMPTOMS ARE DIRECT OR INDIRECT. — CHARACTER OF EACH.

DIRECT SYMPTOMS RESPECT THE SENSATIONS, FUNCTIONS, AND STRUCTURE OF THE PART AFFECTED: —

1. SYMPTOMS WHICH RESPECT SENSATION. — PAIN — ITS DEGREES — ITS QUALITIES. — AMOUNT OF INFORMATION DERIVED FROM PAIN AS A SYMPTOM. — SOURCES OF DECEPTION ARISING FROM IT.

2. SYMPTOMS WHICH RESPECT FUNCTION. — AMOUNT OF INFORMATION DERIVED FROM THEM, AS COMPARED WITH THAT DERIVED FROM SENSATION. — AMOUNT FROM BOTH TAKEN TOGETHER.

3. SYMPTOMS WHICH RESPECT STRUCTURE. — THE INFORMATION DERIVED FROM THEM LIMITED TO PARTS WITHIN REACH OF THE SIGHT AND THE TOUCH, UNTIL AUSCULTATION BROUGHT THE DISEASES OF CERTAIN ORGANS WITHIN THE SCRUTINY OF THE EAR.

In going round the hospital my mind often reverts to the time when I was a mere beginner like yourselves; and I remember how strange and puzzling to me was every thing that I saw; how I thought I never should be able to distinguish diseases, one from another, as long as I lived; and, as to treating them, I could not look forward with the hope that my conscience would ever allow me to attempt any such thing.

Above all, I was perplexed with the number and variety, and (as I humbly thought) contradictory nature of symptoms. It seemed to me, that if I could ever succeed in learning them all, it would be to no profit; for the same symptoms appeared sometimes to import one thing, and sometimes another.

There was a patient, perhaps, suffering convulsions; and the physician evidently thought the case most grave and perilous, for he employed several remedies of the most gigantic power, and succeeded in saving him. But there was another patient suffering convulsions no less severe, and to my apprehension just of the same kind, yet so far was the physician from thinking seriously of this case, or treating it severely, that he just looked at the patient and smiled, ordered some cold water to be thrown in her face whenever the convulsions returned, and said that would cure her; and, sure enough, he was right. Moreover, many died who seemed to me to have little or nothing the matter with them, and many recovered whom I did not hesitate to condemn to death at first sight.

Thus health and sickness, and life and death, seemed the most mysterious things in the world; and the symptoms which were said to indicate them were to me a long while unintelligible.

These recollections, at this day so often present to my mind, enable me to place myself in your situation. They serve the good purpose of making me feel, that just the same difficulties which are yours now were once my own, and of making me wish to aid you by my little experience in removing them.

Yet the very objects which have puzzled me, and are, perhaps, now puzzling you, do in fact contain infinite instruction. It is by symptoms, and by symptoms only, that we can learn the existence, and seat, and nature, of diseases in the living body, or can direct and methodize their treatment. But, first of all, symptoms themselves must be understood, before we can make the proper use of them for gaining the instruction which they are calculated to convey.

It is important for us to understand that the symptoms or signs of diseases are never to be taken in the like sense with that in which the signs of external things are often regarded. The buoy which, floating in the river, marks its navigable tract; the bell which, by striking, denotes the lapse of time; the stone by the way-side, which tells us how far we have come, and how far we have yet to go; these are most important *signs*, and of indispensable service to us all, but they have no *natural* connexion with the things they are made to indicate. They are mere expedients, of conventional meaning and use. Navigable rivers, and time and space, would still exist, though there were neither buoy, nor bell, nor milestone, in the universe.

There is nothing that we call the symptom of a disease, which does not contain within itself much more than a mere sign. Heat, pain, redness, swelling, are called the signs of inflammation; but nature does not intend by them barely to intimate that inflammation exists; they are essentially connected with the processes she is carrying on.

Thus at early dawn we point to the first glimmering in the east, and call it a *sign* of the rising sun; but it is more,—it is an emanation from his beams. We look at the cloud above our heads, and say it is a *sign* of rain; but it is the gathering of the waters themselves.

Concerning symptoms I would nevertheless remark (what is very important to be borne in mind), that they stand in different relations to the diseases to which they belong. They may flow out of the disease, so as, in idea at least, to be separable from it; or they may be involved in the disease, so as to be identical with it. The difficult respiration, the cough, the sputa, the emaciation, the hectic, are the symptoms of phthisis, and are distinguishable from the disease itself. They are the signs of something beyond themselves, which we do not see — viz. tubercles of the lungs. But the symptoms which denote an intermittent fever are the same which constitute the disease. We have no idea of an intermittent apart from the rigor, the heat, and the perspiration. The same may be said of other fevers, and of almost all diseases not organic, in which, if you seek to separate the symptoms from the disease, you must resort to theory for the purpose, and conceive an action of a certain kind prior to the *actions* which constitute the symptoms, and productive of them.

There are then symptoms which, in the plain and intelligible sense, are signs and tokens of the disease that exists separately and distinctly from them; and there are symptoms which, however they may be spoken of as signs merely, are, nevertheless, all *that we know* of the disease itself. The disease is the symptoms; and the symptoms are the disease.

True: but it can hardly be conceived that they are in reality the same. Yet it is better that they should be so regarded, than that we should go beyond our knowledge in attempting to distinguish them. Better to see in fevers only a certain combination of symptoms, than to run wild about a debility of the nerves, a spasm of the extreme vessels, or a peccant matter in the blood.

Again; I would remark that it is often most difficult to draw the line between what is disease, and what is symptom; and that the same conditions may, in different cases, become now one and now the other. A dropsy, or an hæmorrhage, are sometimes primarily and essentially *the disease*. Sometimes they are secondary, and incidental to *the real disease*, and are themselves only symptoms.

How impossible, then, must it be to give any definition of a symptom which shall be *philosophically* true, and at the same time satisfy every sense in which it is practically regarded!

From the imperfection of our knowledge the whole subject of semeiology is beset with philosophical difficulties; and no advantage will be gained from conducting our inquiry concerning it in a stricter method than its own nature will bear.

Whatever it is that bespeaks the presence of diseases, or denotes their nature or their seat, or, moreover, whatever indicates the proper method of treating them, may be equally regarded in the character of a symptom. At present I shall restrict myself to the symptoms which denote the disease, reserving those which indicate the remedy for future consideration.

There are certain popular tokens of disease which all the world is acquainted with. A man is generally known by his friends to be ill before he submits his case to a physician. They judge, and judge rightly, from his complexion, his aspect, his voice, his gait, or something unusual and unsatisfactory in his whole form and behaviour. And these circumstances, which strike every body, are not unobserved by us. All can gather from them that disease is present somewhere; but *we* can often draw from them intimations of its very nature and seat.

But how much soever physicians may learn from what constitutes the physiognomy of diseases in its largest sense (and, indeed, they may learn a great deal), their more accurate knowledge is derived from symptoms which admit of a more exact analysis. Upon such I propose principally to dwell.

Of symptoms some belong immediately to the part affected. They proceed immediately from it, and are referred immediately to it. We will call these *direct symptoms.* Others, belonging originally to the part affected, declare themselves through the medium of other parts, or through the medium of the constitution at large. We will call these *indirect symptoms.*

To begin with direct symptoms, there are those which respect the sensations of the part, in whatever way they may differ from what is natural.

Now, concerning unnatural sensations as evidences of disease, to what extent they exist, or whether they exist at all, we are not competent absolutely to determine. In matters of feeling we must depend entirely upon what our patient tells us. Every man smarts with his own pain; himself, and nobody else, can say how much. We must presume, therefore, that our patient has no disposition to deceive us; and, giving him credit for the correct expression of his own feelings, we must act upon his information concerning them.

Pain and uneasiness! These are general terms. But there is more to be learnt upon the subject of morbid sensations than what these terms are calculated to convey.

There are qualities and peculiarities of pain arising from parts which are disordered, diseased, or injured, as there are qualities and peculiarities of sensations arising from parts which are healthy.

Ask the man whose leg has just been amputated, and he will tell you that he suffered one kind of pain when the knife divided the skin, and another when it cut through the muscles; and that sawing through the bone gave him still a different pain. Ask the man who has just suffered the operation of a violent purgative, and he will tell you, that after taking it he first felt oppression and nausea; that presently the nausea became fainter and fainter, until it was exchanged for real pain; twinges and griping arose, and became more and more acute, until they were relieved by an evacuation from the bowels.

Here we see various peculiarities of uneasiness arising from the same mode of irritation applied in succession to the different parts of the intestinal canal, and the different structures which go to the formation of the leg.

Pain in vital parts is different from common pain; and the pain in one vital part is different from the pain in another. In the brain it is heavy and stupefying; in the heart and lungs, and contiguous structures, it is apt to be acute, and generally much circumscribed, or confined to a spot; in the liver, the uterus, and testicles, it is oppressive and sickening.

Pain varies also in parts not vital. In skin, cellular structure, and muscle, it rouses and excites; in tendon, ligament, and bone, it rather oppresses; in nerve, it is numbing, prickling, or intolerably acute, and often runs along a string (as it were) to a considerable distance. Witness tic douloureux; witness the sciatic affection.

But, besides the qualities and peculiarities of pain belonging to several parts, and denoting *generally* their unhealthy condition, there are those which belong to the same parts under different states of disease, and are thus expressive of *the kind* of morbid action which produces them. There is what is called throbbing pain, in which the patient, simply by attending to the part affected, may count his own pulse. This throbbing pain is characteristic of inflammation just at the point when it is passing from the adhesive to the suppurative stage. There is a pain which is called lancinating, almost the constant concomitant of cancer, and very different from the pain which would attend common inflammation in the same parts of the body.

The sense of pain is in proportion to the magnitude of the disease, only within certain limits. The extremity of the disease may abate or even abolish the sense of pain altogether. Thus, there are circumstances in which it is in vain to seek to learn the existence of pain by interrogation merely: the sense of it must be awakened by hard pressure or rough handling of the part in which the disease is thought to reside; and sometimes even these are insufficient for the purpose. The sense of pain is irrecoverably gone. Surely there is a benevolent intention conspicuous in all this. The way of death is often smoother than the path of life; and great bodily anguish (there is reason to believe) does not often enter largely into the process of dissolution.

But I do not wish to insist upon pain, its quantity, and peculiarities, as infallible criteria by which to detect what is the seat of the disease, and what its kind. It is possible to speculate too curiously upon morbid sensations; to speculate even so far as to deceive ourselves respecting them. Besides, the patient himself, by an over anxious and over constant attention to what he feels, is liable to miscalculate the kind and quantity of his own sufferings, and thus to mislead you by exaggerating every little ache into an intolerable grievance. Again; the patient himself, by habitual disregard of what he feels, is liable to miscalculate in the opposite way. He either has no pain, or he owns to none, where another would complain of a great deal; and thus he misleads you by extenuating a real grievance, or entirely passing it by. Neither of these can be safely trusted for a correct interpretation of their own sensations.

It is an important practical truth, well worthy of being remembered, that diagnosis is capable of being greatly aided or greatly obstructed by the *personal character* of the patient. Education, and the better habits of civilised life, render men more rationally attentive to their internal sensations and better able to describe them; whereas over refinement engenders such excessive care and regard of the feelings, that it contrives to sophisticate and spoil them; and barbarity acts so much in spite of them, that it blunts or nearly abolishes them altogether.

Plain sensible men, who feel just what they ought to do, and tell just what they feel, are the most agreeable patients to attend. You make out their complaints easily and satisfactorily; they have noticed the first *real* deviations from healthy sensation, and can describe them intelligibly; and they obtain from you an earlier and more certain relief. But soft, delicate, nervous persons, who feel extravagantly, and still exaggerate what they feel, are very troublesome to deal with. You are not certain that they do not deceive both you and themselves; and such a perplexity is cast over their complaints, that you can neither understand them nor treat them properly. Again; the stupid and half civilized, who are often literally *insensible* to their disease until it has endured a long time, and made a considerable progress, and done formidable injury to the parts concerned, can hardly give you any help to the knowledge of their complaints by their own description of their feelings.

I have often remarked, in the victims of extreme intemperance, that they have little or no consciousness of the pains and disordered sensations proper to the diseases which they suffer. This strange want of correspondence between the symptoms of disease derived from other sources, and those derived from the sensations, is a subject of very curious speculation medically, and of very melancholy interest morally. For the chief cause of the anomaly I believe to be really that to which I have alluded. There are whole classes of society in London who are never really sober for years together. The sensations proper to health and to disease are alike unknown to them. In health, the stimulus of spirits, renewed day by day and hour by hour, gives them feelings and excitement which are unnatural; and however they may be mistaken for those of health, do in truth not at all belong to it. They are better, perhaps, and more pleasurable, than any that health has to give; and they have superseded them. In disease (disease which it has itself produced), the stimulus of spirits gives them feelings and excitement which are still unnatural, and disguise or supersede the sensations which they then ought to have.

People are frequently brought into the hospital just ready to perish of complicated visceral disease, yet declaring that they never suffered ache or pain in their lives until a few weeks ago. Their liver, spleen, kidney, and heart, and blood-vessels, are all disorganized. They are breathing, perhaps, with one lung; and the cellular structure and some cavities of the body are distended with fluid. Here is a disease which must have been the growth of years; yet true it is, as they say, that they have felt neither ache nor pain until within a few weeks. Spirits — spirits more and more recklessly taken — have sustained and excited, and cheated them, with false strength and false feelings, till fluid has gushed out every where, and vital organs have been suddenly oppressed, and down they have sunk at once, and irretrievably.

Nevertheless, the inquiry into morbid sensations is most interesting in itself, and most proper and necessary to be pursued for pathological and practical purposes.

There are complaints of sensation, and sensation merely. People feel burning heat and pinching cold, in opposition to the indications of the thermometer, and in opposition to the perceptions of the physician, who applies his hand to the person of his patient without being able to confirm the fact by his own feelings. People will complain of severe pain upon some external surface, which exhibits no visible mark of disease.

These complaints of sensation, and sensation merely, often occur in those whom you cannot suspect of any intention to deceive you. They are often real diseases, and being such, are generally most difficult to cure. But these complaints of sensation, and sensation merely, are those which people most frequently counterfeit when they have an interest in being believed to be ill; and they often counterfeit them successfully, owing to the extreme difficulty of detecting the deceit. Yet even here the physician would make the probability of deception less, if he were acquainted with the kind of pain which is usually felt in that part to which the patient refers it.

But, although we may learn from this order of symptoms all that they are in their own nature capable of teaching us, yet, in almost every case we meet with, we shall find a necessity of inquiring into other symptoms, if we would know the real condition of the part which falls under suspicion of disease. The majority of complaints are not such as declare themselves by *this* or by any one order of symptoms only. Diseases of *mere* sensation are very few.

Now there are other direct symptoms (symptoms immediately referable to the part affected) besides those which respect its sensations; and these are in truth more important, on account of the more certain information which they are calculated to convey. These other direct symptoms respect the functions of the part.

If the patient own to pain in a part, we suspect that part to be the seat of some morbid affection; but we are not satisfied that it is so, nor can we tell what the morbid affection is, until we have made further inquiry.

Suppose a man complains of pain in the head. It may be a mere nervous pain; it may be a sick headache; or it may be a symptom of inflammation of the brain. But we cannot tell what it is, and (what is worse) we cannot prescribe with any reasonable chance of procuring relief, until we have ascertained many more particulars concerning it.

Or if the patient own to no pain, yet, if a part has fallen under a suspicion of disease, we cannot be satisfied that it is healthy until we have made other inquiries. I have known people die of diseases of the brain, of the lungs, of the heart, who have suffered no pain whatever.

It appears, then, that whether we learn much or little, or nothing, respecting the sensations of a part, there is always a necessity for further inquiry, if we would know the nature of its complaint.

Our further inquiry is still into direct symptoms viz. those which respect the functions of the part.

The symptoms which respect function are of much more practical value than those which respect sensation; and for this consideration especially, that the knowledge which they convey is less fallible in itself, being the result, not of what we ask and another tells us, but of what we see and note for ourselves. In obtaining it, we depend not at all upon the representations of the patient, but entirely upon our own observation and reasoning.

But, concerning the direct symptoms which respect the functions of parts, and which consist in the various deviations of those functions from their healthy state, let this especially be borne in mind, that valuable as they are themselves, to *us* they will be of much, or little, or no use, according as we take much, or little, or no care, to prepare and capacitate ourselves for understanding them. *Every body* cannot tell when and how the functions deviate from what is natural. A competent acquaintance with physiology must precede and prepare us for such knowledge. We must begin with what is natural and healthy, and afterwards inquire into what is unhealthy and disordered; and thus learn the latter by comparing and contrasting it with the former.

As the anatomy of healthy structure must always be the beginning and foundation of morbid anatomy, so must the physiology of healthy function be always the beginning and foundation of morbid physiology; for by this name of morbid physiology I will venture to call the knowledge of all the various ways in which the functions of the living body and its several parts are capable of being perverted and deranged.

Some interruption or derangement of their ordinary functions probably always attends disease or injury in every part and structure of the body; such interruptions or derangements, being discovered, are the symptoms which bring us home to the seat of complaint more surely than any other.

But there are parts in which they are not discoverable; namely, those of which the ordinary functions are unknown, as the spleen. And there are parts in which I will not say that they are not discoverable, but only that they are never discovered — namely, those whose functions are so mixed and blended with the functions of other parts, that it is impossible to determine how much belongs to them and how much not, either in health or in disease. Who shall say when the pancreatic secretion is redundant or defective, or of an unhealthy quality?

But the brain and the nerves; the heart and the blood-vessels; the lungs, the liver, the stomach, and the kidneys; all give direct intimations of their diseases, by the interruptions and derangements of their ordinary functions.

The brain and nerves exhibit direct symptoms of their diseases in every manner and every degree in which sensation or voluntary motion, the senses or the intellect, are capable of being impaired or perverted. The heart and blood-vessels exhibit direct symptoms of theirs, in the strength or weakness, the unusual extent, and the irregular succession of their pulsations, and the sounds accompanying these; also in many qualities and varieties of the pulse, and in the unequal course and distribution of the blood itself.

All are acquainted with the direct symptoms which impute diseases to the lungs, when, instead of a respiration which should be easy and uninterrupted, there is panting and wheezing, and stertor, and cough; and when, instead of the humid vapour which in health is separated by the bronchi, and mingles and glides forth with the breath, there is a hard and difficult expectoration of phlegm, of mucous or purulent secretion, or of blood.

But the direct symptoms which impute diseases to the lungs most unequivocally, and which make the most precise discovery of their nature and seat, are not of common or popular apprehension. There is a method by which the entire lungs, and each separate portion of them, can be scrutinized, and by which we can learn where respiration is perfect, and where it labours. It is the method of auscultation. And this method of auscultation does not merely discover a defect or failure of function in the lungs at this part or that, and so leave us to infer, from reasoning or from other circumstances, the exact nature of the disease (this indeed, would be a great deal, and as much as the direct symptoms which respect the functions of parts are generally able to do); but it often leads to more — discovering not merely the symptom, but the disease itself.

The excess and defect of bile, and various qualities of that secretion different from those of health, are the *direct* symptoms by which the liver shows itself morbidly affected. And the common consequences that immediately flow from impediments to the digestive function are the direct symptoms by which the stomach declares its complaint. Such are distensions, eructations, and rejected food, which has undergone the process of fermentation, and become acid and putrid: for these plainly show that the substances submitted to the stomach have been left to suffer the chemical changes to which they are naturally obnoxious, the organ having lost its controlling power over them.

So, too, in the various changes which the urine is apt to suffer, in its excess and its defect, in the predominance of an acid or an alkaline quality, in its amorphous sediments and its crystalline deposits, we have the direct symptoms, which lead us to search for disease in the kidneys.

But each of these systems and organs requires from the student an express acquaintance with its natural functions, before he can be prepared to examine and appreciate their errors and defects; and then these errors and defects themselves he must expressly study, before they can yield him all the information which, as direct symptoms of disease, they are calculated to convey.

Now, whatever part be affected, when we bring our own knowledge of its disordered functions, and add it to what the patient tells us of its disordered sensations, we shall generally come somewhat nearer to a right notion of the seat and nature of the complaint; sometimes, indeed, to a *perfect* comprehension of it, so far as it is capable of being ascertained at all; inasmuch as there *are* conditions of disease into which no further inquisition can be made when we have learned the feelings and the functions of the part to which they belong.

Many of the local complaints which we are called upon to witness and to treat, are *not* of a nature to affect the structure of the part. In them it is not clear that there is any thing to be ascertained beyond the symptoms which respect its sensations and functions; whether, if the part were laid bare to us, and we could see and handle it, we should have any better notion of its complaint, or how to treat it. A man has a pain in his stomach, and he cannot digest, and yet he has no organic disease; and this being the case, I really do not comprehend how we are more likely to learn the cause of the pain and the indigestion, or the proper method of its relief, seeing the stomach, than seeing it not.

But with all the knowledge of disordered functions which our best observation can furnish us, and all the knowledge of disordered sensations which the patient's faithful interpretation of his own feelings can supply; with all the light which sensation and function can, as direct symptoms, throw upon the disease of the part affected; still we often need *other* symptoms and *more* light to inform us what the disease really is, and what its treatment should be.

There is yet another order of direct symptoms besides those which *immediately* respect the sensations and functions of the part — viz. those which *immediately* respect its structure.

When parts are within reach of the sight or the touch, we can often judge whether their forms and structure be different from what they ought to be, and thus obtain direct evidence of their disease: and this evidence may be all that we require. What we see, or what we feel, may convey to us a complete knowledge of the disease, and render all consideration of other symptoms unnecessary. Sometimes these visible or tangible deviations from healthy structure are not only the direct symptoms expressive of the disease, but the disease itself.

In the morbid affections of external parts we can examine at once their state and structure, and learn in what respect they differ from what is natural; and the observation of this *direct symptom* almost supersedes the necessity of inquiry for any other; for herein we witness the very manner and process of the disease itself. We see the increased vascularity and tumescence which constitute inflammation, the lymph which is the material of adhesion, and the fluid which is the essential product of suppuration. We see all those sensible changes in the condition of the skin and cuticle which constitute the many orders and varieties of cutaneous diseases — rashes and vesicles, and pustules and scales; in which it is obviously impossible to distinguish the symptom from the disease, or the disease from the symptom.

Again: we learn by the touch that the os uteri is changed in structure — that it is scirrhous, or that it is ulcerated, or that a polypus passes through it or grows from it: and here we have not only the palpable evidence of the diseases, but the diseases themselves.

But our business, as physicians, is chiefly with internal parts and organs; all of which are beyond the reach of our sight, and but a few perceptible to the touch; and these few only under certain conditions of disease.

Some organs of the abdomen, when disease has produced an increase of their natural bulk, become palpable through the integuments, and allow an examination of their shape and dimensions. But, after we have in this manner obtained such information as is possible respecting the structural condition of an internal organ, let us be careful to estimate it properly, and not to value it for either more or less than it is worth.

To ascertain by the touch that certain organs within the cavity of the abdomen have undergone an augmentation of their natural bulk — that the liver, or the spleen, occupy a space far exceeding that which nature has allotted them, beneath the cartilages of the ribs on either side — is, without doubt, to fix disease upon them. But it is not to determine the nature of the morbid processes which either are or have been in action within them. Finding the spleen enlarged, or the liver enlarged, we have the palpable result of some morbid action; but what that morbid action has been, and whether it is still in progress (the only questions which are pathologically or practically important), we must seek to discover by other symptoms. The increased bulk, then, of an organ, is a symptom, a direct symptom, of great value and certainty in fixing the *seat* of disease, but nothing more.

But it is by another sense that we are admitted to a much more intimate scrutiny of an internal part than any which the mere touch can afford; and thus obtain *direct symptoms* of its disease which are often as infallible as those derived from sight itself.

By auscultation we not only become acquainted with the remote effects or ultimate results of morbid action, but often, when the disease is just doing its first rudiment of injury, the secret of its proceeding is betrayed to the ear.

The ear not only discovers the vomica or cavity, which is the last of many changes wrought by tubercular disease upon the structure of the lungs; not only finds their permeable texture converted into a solid mass by the gradual deposition (it may be) of tubercular matter, or (it may be) of inflammatory lymph; but it can detect the first effusion produced by inflammation into the vesicles of a single lobule: it can detect pneumonia almost, perhaps altogether, simultaneously with its beginning to exist.

LECTURE VII.

ON THE DOCTRINE OF SYMPTOMS.

DIRECT SYMPTOMS OF DISEASES AFFECTING THE STRUCTURE OF THE THORACIC ORGANS, KNOWN BY MEANS OF AUSCULTATION. — MODES OF AUSCULTATION. — PRELIMINARY ACQUAINTANCE WITH MORBID PROCESSES ESSENTIAL TO ITS SUCCESSFUL USE. — PRECISE NATURE OF ITS OBJECTS IN RESPECT TO DISEASES OF THE LUNGS. — GENERAL DIRECTIONS FOR ITS USE. — AUSCULTATORY SIGNS OF HEALTHY LUNGS. — AUSCULTATORY SIGNS OF DISEASED LUNGS — KNOWN IN THE ACTS OF BREATHING, SPEAKING, AND COUGHING. — THESE SIGNS CONSIST IN DRY SOUNDS AND MOIST SOUNDS.

Recollect for a moment the inquiry in which we were engaged, and how far it has proceeded. It is an inquiry into the nature of symptoms; and hitherto we have spoken of symptoms *directly* referable to the part affected; those which regard its sensations, and those which regard its functions; and we have endeavoured to estimate the information which these are respectively calculated to convey. We have spoken also of those which directly regard its structure; and are now considering the information to be gathered from them.

This information, it should seem, is necessarily very limited in regard to internal organs in general; but the thoracic organs are excepted from the rest, because, being within the cognizance of another sense, and thus subjected to a method of investigation peculiarly applicable to themselves, all their actions and conditions are more clearly perceived and known. This is the method of auscultation.

There are different modes of performing auscultation. In one mode we apply the ear itself to the surface of the chest: this is (what is called) immediate auscultation. In another, we apply the tube to the chest, and the ear to the tube: this is mediate auscultation. In another, without applying the ear to the chest either immediately or mediately, we strike its walls with our fingers, and listen to the sounds which result: this might be properly called auscultation by percussion. But percussion and auscultation are often spoken of, as if they were different things, whereas they are only different modes of appealing to the same sense; for we gather our information equally from what we hear, whether we strike the chest or apply our ear to it, or use the instrument.

I have often taken occasion to point out to you the importance of pathological knowledge to the just diagnosis and the successful treatment of disease; and, as a part of pathology, I have laid especial stress upon the knowledge of morbid processes. Now the use which you will or will not be able to make of auscultation, will depend upon your knowledge of the pathology of those organs to which it is applied.

The sounds which reach the ear through the walls of the chest during breathing, or speaking, or coughing, varied and modified by divers diseases of the organs within, are easily discriminated. Any person not deaf will soon learn that there is some distinction of these sounds. But we may distinguish them correctly, and call them by right names, and make a musical scale of them, if we please, and still know nothing of the morbid conditions which they indicate, and out of which they arise. These cannot be discovered by a discriminating ear *only;* they must first be known what they are in themselves. By means of auscultation, various diseases of the heart and lungs are capable of being detected with wonderful certainty; but the power of so detecting them belongs to those only who have studied these diseases in all the processes of their formation, and progress, and results.

It is with hearing as it is with the other senses. When they are taxed to give intimations to the mind concerning the objects by which they are impressed, it is necessary that the mind should have a previous knowledge what those objects are. Place a man within sight of London, and give him a telescope, and tell him to look for St. Paul's. St. Paul's he will undoubtedly see, and many a striking object besides; but he will not be able to distinguish it from Westminster Abbey or the Monument, unless he is previously instructed what sort of building St. Paul's is.

A child will at once perceive a difference between the fragrance of the violet and of the rose; but it must know the violet, and know the rose, and smell them both singly, and by turns, before it can assign to each its peculiar sweetness.

Any man can discern a difference between the sound of a trumpet and of a drum; but he must have been where trumpets have been blown, and drums been beat, ere he can tell which sound belongs to each. My voice is different from yours; but a man must be familiar with you and with me, and have heard us speak a hundred times, before he can distinguish us by our voices.

So diseases of the chest have, as it were, different voices; but we must first be familiar with the diseases themselves, and then be accustomed to hear them speak, ere we can tell one disease from another by its voice.

What *are* diseases of the chest? Pneumonia, pleurisy, phthisis. And *do* we mean that auscultation can distinguish each of these from the other? Yes, truly; and we mean more than this — much more.

Pneumonia, pleurisy, and phthisis are only the complex of several morbid processes and results. There is no such thing as a pneumonic, a pleuritic, or a phthisical sound. Pneumonia, pleurisy, and phthisis have no sounds that are peculiar to themselves *as such:* but the sounds that we hear in these diseases result from certain morbid processes going on, and certain changes wrought upon the structure of parts; which processes and changes make up the complex to which we give a name. We hear the sounds denoting that this part of the lung is loaded with fluid, that part condensed with solid matter, and another hollowed with cavities. Thus we get at inflammation; thus we get at phthisis. We anatomize by auscultation, if I may say so, while the patient is yet alive, the very processes and changes of structure of which inflammation or phthisis consist: and so of other diseases.

Auscultation professes to make us acquainted with the actual condition of the lungs in many of the most important diseases incident to them; their actual condition at any *particular time;* and their changes from one condition to another *from time to time.*

I am not aware that, before auscultation lent its aid to diagnosis, we could do more than speak generally concerning the diseases of the lungs during the life of the patient. We could affirm generally that the lungs were inflamed; and, knowing, from our acquaintance with morbid processes, that it was the tendency of inflammation to produce such and such changes of their structure, we were aware what perils it involved, and could anticipate with tolerable accuracy what we should meet with when the patient died. So, too, we could affirm generally that there were tubercles or vomicæ in the lungs; and, understanding the forms and processes of phthisical disease, we could foretel in the main what we should find after death.

But auscultation anticipates the disclosures of morbid anatomy. Nearly all that dissection can unfold, it tells while the patient is yet alive. It does more: it brings us acquainted with diseases long before they have reached their fatal stage. By dissection we come in with our knowledge *at last*, and gain assurance of the disease from its ultimate results. By auscultation we are often —very often—enabled to make our knowledge keep pace with the disease from its least and earliest beginnings, through all the stages of its progress to the end. By auscultation we contemplate a living action going on, and have cognizance of it while it is yet at work. By dissection we contemplate the ruin as it is left, when all action has ceased.

I am not going to give you a regular didactic discourse upon auscultation: you can only learn it for yourselves, by the use of your own ears, in the wards of the hospital. And even by your own ears it is hardly possible to learn it any where except in the wards of a hospital; for you must have many patients to practise upon at the same time; and, moreover, you must have many fellow-students engaged at the same time in making the same observations with yourselves, that you may compare notes together, and agree about what you hear. I am quite sure that no man can arrive at any useful or safe conclusions from auscultation, if he studies it alone. I speak from experience when I say this. When I first turned my attention to auscultation, I found so many sources of deception connected with it, that I determined to admit no fact which was not attested by others besides myself; and I would advise you to proceed at first with the same scrupulous care. "That every thing is easy when you know it," sounds like the simplest of truisms; but, indeed, it is a very wise apophthegm. It imports that, be a thing ever so difficult, you may, by taking the necessary pains, obtain such a mastery over it, as to be surprised that you ever thought it difficult at all. Auscultation surely is not the most difficult thing in the world; neither is it the easiest. It is beset with many perplexities, and requires much time, and labour, and patience, and caution, to master it perfectly; but, being mastered, it becomes the safest, simplest guide, within its proper sphere, to a just diagnosis.

But auscultation, I have said, can only be learned within the walls of a hospital. Yet, perhaps, I may be able to give you some general directions how to proceed, which may be of use to you; and I wish to speak of auscultation at present as it respects the lungs only.

Now before you seek to acquaint yourselves with the sounds which indicate diseases of the lungs, you must learn those which are expressive of their healthy state: for the healthy sounds must be your standard of comparison in judging of the unhealthy.

It is useless for me to attempt to describe (what is called) "the healthy respiratory murmur;" I could only tell you that this sound is like some other sound with which you might be more familiar. But in a few weeks you will know the respiratory murmur so well by experience, that it will itself become the most familiar of all sounds. The pure perceptions of sense cannot be made clearer by descriptions and similitudes.

I would recommend students to practise auscultation upon each other, for the sake of learning what the healthy respiratory murmur is; and to do it often, and upon many individuals. The respiratory murmur is, I believe, the same in kind in all men who have healthy lungs; but it has differences of degree belonging to it in different men, which are somewhat puzzling at first. It does not reach the ear with the same clearness and loudness in the fat and the lean man. Fat and muscle damp the sound, where they abound above measure, as effectually as coats and waistcoats. Ausculting a man who is very fat and muscular, is like ausculting a man with his clothes on: you must make the same allowance in both cases.

But still the reason why the healthy respiration is more or less audible cannot always be found in the integuments of the chest. It often happens, that in a thin spare man, whose lungs are perfectly sound, you can scarcely hear it at all, while in a fat man you hear it most distinctly; and, what is more remarkable, in a fat woman, even through the mamma.

People seem to me to differ very much in the mode and intensity of their breathing: some fill their lungs at every inspiration: the air appears to go further, and to dwell longer, within them. They breathe as if they had a luxury in breathing; and your ear seems to follow the air through every cell and vesicle as it goes in and out. Some, on the contrary, let the air just enter into their lungs, and come back again. They breathe as if they were afraid of breathing; and your ear can hardly detect any respiratory murmur except when they breathe with a forced effort.

It is probable that these diverse modes of breathing, in people perfectly healthy, are required by peculiar states of the circulation; and that they are natural and necessary provisions, not only consistent with health, but essential to it.

In children the respiratory murmur is far more audible than in adults; and on this account it would be well for those to whom auscultation is new to make their first trials upon children, that they may know what the healthy respiratory murmur is in its full and complete development.

That the parietes of a child's chest are thinner, there can be no doubt; and this *may* be one cause why its breathing is more audible. But the mode and intensity of the breathing itself is the chief cause; and this peculiar breathing of a child is in obedience to some natural necessity, and that necessity is probably respective to its circulation.

In adults (even in fat and muscular men and women) the respiratory murmur is sometimes as loud as in a child. But then it is generally in *some part* only of the lungs that it is so; and when this is the case, it is the result of disease, and the disease is demonstrably of a nature to require that a larger quantity of air should be received into that portion of the lungs whence the louder respiratory murmur issues, and that there should be a more energetic act of respiration.

All this you will soon be able to verify for yourselves, by numerous cases in the wards of the hospital.

Having learned the natural respiratory murmur, the sound which indicates that the lungs are healthy, you have got your standard of comparison, and are now prepared to judge of the sounds which denote their disease, as far as they are connected with the respiration. But you have got more than a mere standard of comparison by which to try the quality of other sounds. You are enabled to appreciate *simple* defects and failures of the respiratory murmur itself; and, indeed, it is as important a part of the business of auscultation to learn the extent to which the respiratory murmur is absent, as to discriminate the kind and character of the *new* sounds which are present and have superseded it. Besides, the diseases of the lungs are neither few nor inconsiderable in which auscultation finds no new or unnatural sounds whatever, but only the natural respiratory murmur abated, or abolished; and these *privative* signs are as valuable helps to the diagnosis of pulmonary disease, as any that are most positive and real.

But, after all, let it be borne in mind that the auscultatory signs of pulmonary disease are not all developed in the act of breathing: many occur in speaking or coughing; as will hereafter be shown.

It seems to me that it would be enough for all practical purposes if the unnatural sounds referable to the lungs, whether in breathing, speaking, or coughing, were divided *generically* into two; into *Dry* sounds and *Moist* sounds.

By dry sounds I mean those which result when bronchi, vesicles, or pulmonary cavities, present impediments, or rebounding surfaces, to the passage of air, and thus become sonorous or vocal from reverberation. By moist sounds I mean those which result, when bronchi, vesicles, or pulmonary cavities, present fluid to the passage of air, and thus yield a crackling or bubbling noise from the mingling of air and fluid together.

Of these sounds, the dry and the moist, I will point out such well marked varieties as (I conceive) need to be understood, and will endeavour to give to each an appropriate name; taking care in the meantime to treat the subject as little artificially as possible, while I state fairly and faithfully, from my own experience, *how* I have used, and *what benefit* I have derived from using, this newly invented key to the diagnosis of thoracic diseases.

LECTURE VIII.

ON THE DOCTRINE OF SYMPTOMS.

RHONCHUS AND SIBILUS — WHERE AND HOW PRODUCED. — HOW THEY INTERFERE WITH THE RESPIRATORY MURMUR. — IN WHAT SENSE THEY ARE DRY SOUNDS. — THEIR PATHOLOGICAL IMPORT. — CONDITIONS UNDER WHICH RHONCHUS OCCURS — CONDITIONS UNDER WHICH SIBILUS OCCURS — ILLUSTRATED BY COMMON FORMS OF BRONCHIAL DISEASE; BY ASTHMA, AND BY A PECULIAR FORM OF ACUTE BRONCHIAL INFLAMMATION.

BEFORE I employ any terms to designate particular sounds, I would remark that the language of auscultation is not yet uniform. All writers do not use the same terms to designate the same things; and, until they do, some inconvenience must continue to be felt. Under these circumstances, I shall take the liberty of using those which have become current in St. Bartholomew's Hospital, and have had here a certain meaning attached to them.

In considering the direct symptoms of diseases of the lungs derived from auscultation, I will begin with that part of their structure which is most obnoxious to disease; for there *is* a part in which disease is found most frequently to begin, and to which, wherever else it may begin, it is almost always found ultimately to reach. This is the mucous membrane of the bronchi and their ramifications.

It is essential to the healthy respiratory murmur, not that the bronchi and their ramifications be merely free and pervious in every part, but that their surface be equal and smooth, and lubricated with moisture, and that the moisture be not in excess. If the surface be unequal, rough, or unlubricated, dry sounds reach the ear in the act of respiration; if there be excess of moisture, the sounds that reach the ear are those of air mingling with fluid. The dry sounds thus proceeding from the air passages I will call *Rhonchus* and *Sibilus*, and the moist sounds *Crepitations*.

This Rhonchus and Sibilus, and these Crepitations, are always produced in breathing, not in talking or coughing. And first I wish to speak of what they are in themselves, and of how they interfere with the healthy respiratory murmur; and then I will endeavour to estimate their pathological import.

The terms Rhonchus and Sibilus are perhaps as intelligible in themselves as they can be made by further description. Rhonchus is the larger and hoarser sound; Sibilus the smaller and shriller. And, from what you must familiarly know of the sounds produced by blowing into a pipe of larger or smaller size, you will readily conceive that Rhonchus proceeds from the bronchi in their first divisions, and Sibilus from them in their minute ramifications, or from the vesicular structure of the lungs.

Rhonchus often occurs alone. It is often the only unnatural sound that is heard; and then the affection is of the bronchi in their first or larger divisions exclusively. In this case, to whatever degree the rhonchus supersedes the healthy respiratory murmur, it does so, not in the sense of preventing it *from taking place*, but in the sense of preventing it *from being heard*. The Rhonchus overpowers the respiratory murmur. The greater sound overpowers the less; but the less is extant notwithstanding.

The reason is, that the bronchi in their first divisions have nothing to do with producing the respiratory murmur; it does not arise in *them*, but in the lesser ramifications and vesicular structure beyond them; therefore they have no power to hinder the respiratory murmur, except when they suffer such impediments as absolutely preclude the access of air even to themselves, and consequently must prevent its further progress.

But, in point of fact, it seldom happens that the Rhonchus is loud enough to overcome the murmur altogether; and while they exist concurrently the ear has often a distinct perception of both. There is a loud hoarse sound in several parts, and there is also, perhaps even in the same situations, a clear respiratory murmur. The murmur is, as it were, heard through the rhonchus. In such cases some of the *larger* bronchi contain the cause productive of the dry sound, but offer, nevertheless, hardly any impediment to the free passage of air; which, reaching the lesser bronchi and vesicles of the lungs, and finding them healthy, glides through them, and produces as it goes the murmur which is the best evidence of health.

So, too, Sibilus often occurs alone, and is often the only unnatural sound that is heard during respiration; and then the affection is of the bronchi in their lesser ramifications, or of the vesicles of the lungs. But in this case, to whatever degree the Sibilus supersedes the healthy respiratory murmur, it does so not in the sense of preventing it from being heard, but of preventing it from taking place. And the reason is, that *the parts* which produce the Sibilus and the respiratory murmur are the same; but the *conditions* under which they produce them are different. Consequently the sounds themselves are incompatible with each other, and cannot co-exist.

But Rhonchus and Sibilus, though each often occurs alone, do just as often occur both together. And nothing more is wanted to this event than that a bronchus, through its several divisions and ramifications, large and small simultaneously, should contain the cause capable of modifying the vibrations of the air in its passage.

The moist sounds occasioned by the mingling of air and fluid in the bronchi and their ramifications during the act of breathing, which have been variously denominated, I call by one name, Crepitations; and of Crepitations I only make the distinction of *Large* and *Small.*

Sounds so produced are ever without variety, and can only differ in being greater or less. And according to their largeness or smallness, and the space to which they are extended or confined, they become important signs in all those diseases where a separation of fluid from the mucous membrane of the air passages is a pathological ingredient.

The *Large* Crepitation is occasioned by the mingling of air with fluid in the first divisions of the bronchi. It arises from the same parts as the Rhonchus, but results from a different condition.

The *Small* Crepitation is occasioned by the mingling of air with fluid in the lesser ramifications of the bronchi, or in the vesicles of the lungs. It arises from the same parts as the Sibilus, but is owing to a different state of those parts.

The large and small Crepitation have the same effect of suppressing or superseding the respiratory murmur that the Rhonchus and Sibilus have; and each after its own manner respectively. The Large Crepitation, proceeding from the same parts as the Rhonchus, may overpower the murmur, but cannot prevent it from taking place; whereas the Small Crepitation, proceeding from the same parts as the Sibilus, is instead of the murmur, which it abolishes altogether.

All the bronchi in their primary divisions may contain an excess of fluid, and *Large* Crepitation may be heard over every part of the chest; and yet, through that *Large* Crepitation, a practised ear will be able to detect the respiratory murmur; obscured, indeed, by the louder sound, but itself genuine and healthy.

So, too, all the bronchi in their lesser ramifications, and the whole vesicular structure of the lungs, may contain an excess of fluid, and *Small* Crepitation may be heard in every part of the chest; but, in the meantime, no ear is subtle enough to catch the natural respiratory murmur, for no such murmur exists.

The Large and Small Crepitations may co-exist together in every variety of combination. You may have both Large and Small in every part of both lungs; or Large in one lung, and Small in the other; or Large and Small in different parts of the same lung. And with Large and Small Crepitation thus differently combined, Rhonchus and Sibilus may be still intermingled, and some natural respiratory murmur be here and there distinguishable among all the rest.

I wish now to consider the pathological import of the several auscultatory signs which have been specified, before I proceed to others; for they are practically the most momentous of all. They are few; but they convey vast information, according to the manner and combinations in which they occur. Do not be surprised at this. There are but twenty-six letters in the alphabet; yet these compose all language; and language conveys all knowledge. Think of knowledge, its vastness, its variety, its multitudinous particulars! Yet language has compassed it all; language has delineated it all; and language is daily furnishing to you and to me little pictures of such portions of it as we desire to survey. Still the wonders of language are comprised in twenty-six letters.

Let it not, therefore, seem strange that many conditions of disease are signified by a few simple sounds.

I have called Rhonchus and Sibilus *dry sounds*, because I thought it particularly important to distinguish them from others which, arising from air and fluid in the act of mingling together, are properly denominated *moist* sounds. But I must warn you against inferring, from my designation of them as *dry* sounds, that a preternatural dryness of the air passages is essential to their production; for such is not the case. Indeed, respective to the conditions out of which they arise, I would rather say, of Rhonchus and Sibilus, that they were *not moist*, than that they were *dry*. And if you like it better, there is no objection to your speaking of sounds that *are* *moist* and sounds that are *not moist*, instead of sounds that are *moist* and sounds that are *dry*.

Rhonchus is the most fluctuating and inconstant of all sounds that belong to the lungs. It arises out of various pathological conditions, and out of some that do not deserve to be called pathological at all. It would be affectation to pretend to speak of them all with precision.

People in perfect health are apt to have Rhonchus mixed with the ordinary respiratory murmur: they strive to clear their throat by a forced effort of expectoration, and sometimes bring up a little phlegm and sometimes not; they only displace it. Hereupon the Rhonchus ceases, and the respiratory murmur remains alone. Again, people suffering disease of the lungs are apt to have Rhonchus mixed with all sorts of unnatural sounds. They make an effort to dislodge or reject a little phlegm, and the Rhonchus disappears, but all the other unnatural sounds remain.

In these cases, the cause of the Rhonchus is evidently secreted matter from the surface of the bronchi; but why does it not produce crepitation, and not rhonchus? Simply because it is *not fluid* enough to allow the air to penetrate it, mingle with it, and pass through it. The air, in going in and coming out, passes by it and impinges against it, and suffers a vibration from it; and this yields the sound.

This Rhonchus, which is owing to tough and viscid phlegm clinging to the part upon which it is deposited, is sometimes propagated over the whole, or a considerable part, of the chest; but then the extent of the Rhonchus is no just measure of the quantity of the phlegm. The phlegm may still be very small in quantity; but being lodged in the trachea, or the first divisions of the bronchi, where they are very large and free, it vibrates, like a harp-string, to the impulse of air, and diffuses the Rhonchus far and wide through the chest.

But, whether this explanation be satisfactory or not, it is perpetually happening that a Rhonchus, heard in every part of the chest, is made to cease at once by a stout voluntary effort of expectoration. Indeed I may venture to say, from my own observation, that a Rhonchus may *almost always* be thus got rid of, whether it occur alone or be one amongst other unnatural sounds. And hence I infer that the cause of Rhonchus is *almost always* a small tough moveable piece of phlegm, adhering to the trachea or first divisions of the bronchi.

The cause is, however, sometimes immoveable and permanent, and quite of another kind. Any thing, from within or from without, that has the effect of narrowing or obstructing a bronchial tube, in ever so small a space, may occasion the same sort of sound. Changes of structure within the parts themselves, such as a thickening of the mucous membrane, or the ossification of a cartilaginous ring; or morbid growths from without, such as a bronchocele, an aneurismal sac, or a tubercular mass in the bronchial glands, or in the lungs themselves, — have so compressed or distorted the trachea, or certain bronchi, that the air could not force its way through them without continual vibrations, and without the respiration being constantly accompanied by a hoarse unnatural sound — by Rhonchus.

It is not easy to determine the conditions which are essential to the production of Sibilus. In seeking to assign them, I am left to my own reasonable calculation of what they *possibly may be*, having no direct means of proving what they actually are. I never knew any person die whose only auscultatory symptom was a Sibilus. Yet I believe people may and do die, and I have myself seen several in imminent peril of death, from disease of the lungs, whose only auscultatory symptom referable to the lungs has been a widely diffused Sibilus. Of such cases I will speak presently: they are of great importance, and well deserve to be pointed out.

Sibilus, like Rhonchus, may occur alone, or in combination with other auscultatory signs. But whether alone or mixed with others, it cannot, like Rhonchus, be got rid of by an effort of expectoration. Yet the cause of both may be the same in kind, and different only in situation. A secreted matter, not fluid enough to admit air to mingle with its particles and thus produce a *moist* sound, but so consistent as to present a reverberating surface, and thus produce a *dry* sound, may be equally the occasion of Rhonchus and Sibilus. But in Rhonchus this matter is within reach of a voluntary succussion of the trachea and bronchi to expel it; in Sibilus it is beyond it. In Rhonchus it is contained within the first divisions of the bronchi; in Sibilus, within their lesser ramifications.

Sibilus, whether alone or in its combinations, cannot, like Rhonchus, ever be regarded as an innocent symptom. It is a more unquestionable evidence of disease than Rhonchus, in whatever that disease may consist.

Sibilus is almost always mixed with Small Crepitation. They are united together in the same individual, and often succeed and supersede each other, as if they were contending together for the mastery; now one and now the other being predominant.

This mixture of Sibilus and Crepitation, and the predominance first of one and then of the other, are chiefly seen where both are largely diffused throughout the lungs; and in such cases one may often remark a fluctuation of the general symptoms answerable to this fluctuation of the auscultatory signs; that these symptoms, in their aggregate, become more inflammatory when the Sibilus increases, and less inflammatory when the

Sibilus declines; also that the remedy which abates their general inflammatory character commonly abates the Sibilus; also when the expectoration is freer the Sibilus is less, and when the expectoration is scanty the Sibilus is more.

Now these are, indeed, great practical points, if they be true; and there are always examples enough to be found in this hospital by which you may test their truth. There are plenty of patients who have been suffering cough, expectoration, and dyspnœa, long and habitually, — some from disease which belongs primarily to the lungs — some from disease which is derived to the lungs from the heart. Watch these patients well for a few weeks together; mark the auscultatory signs and their fluctuations; mark the general symptoms and their fluctuations also; mark the treatment, and its adaptation to, and influence upon, both; and then judge whether the practical points, which respect the particular auscultatory sign now in question, are really such as I have represented them.

These cases of *chronic* bronchial affection are the most favourable for teaching the character of Sibilus, and how it stands related to other auscultatory signs, and to more general symptoms, and how it is amenable to methods of treatment. Such cases tell their story (if I may say so) more leisurely: they tell it over and over again, and with many interesting variations, and thus give you time to dwell upon it and understand it.

But still of Sibilus, that is thus mixed with Crepitation, now superseding it, and now superseded by it — becoming less as the expectoration is more, and more as the expectoration is less — increasing as the general symptoms are more inflammatory, and yielding to the same remedies that they yield to; — of this Sibilus I do not pretend punctually to know the local efficient cause, or the exact pathological condition of the parts out of which it immediately arises. I am content to believe (without any curious speculation upon things which I cannot prove) that, upon the access of a more inflammatory action, the secreted matter in many bronchial ramifications becomes more scanty and less fluid, so that the air that is breathed cannot freely mingle with it, and thus Crepitation yields to Sibilus; and that, upon the subsidence of the inflammatory action, the secreted matter becomes more copious and more fluid, so that again the air freely mingles with it, and thus Sibilus in its turn yields to Crepitation.

But Sibilus does not occur under these circumstances only. It does not merely go and come, or occasionally intervene in chronic bronchial disease, of which the auscultatory symptom that is most characteristic and abiding is of another kind. There are cases in which Sibilus is itself the most characteristic auscultatory symptom, — cases in which for a long period, and cases in which even from first to last, there is no other auscultatory symptom whatever but Sibilus.

There are cases of (what I suppose would be called) genuine asthma, that present some such symptoms as these: dyspnœa, or rather an agony and fighting for breath; livid lips; cold and livid extremities; and a dry ineffectual cough, terminated and relieved, after an uncertain interval, by a copious puriform expectoration. Here, during the agony or paroxysm (and unfortunately it often continues long enough to allow a very leisurely examination of the chest by the ear — sometimes many days, sometimes a week or two), the sole auscultatory sign is a Sibilus pervading a larger or smaller portion of the lungs, according to the severity of the case. And, as the agony lessens, and the expectoration begins to appear, Crepitation is found mingling itself with Sibilus; and, when the agony has *entirely* ceased, and the expectoration become more copious and free, Crepitation, and Crepitation alone, is then heard in the same situations, and to the same extent, that Sibilus, and Sibilus alone, was heard before.

I have witnessed instances of asthma in several individuals, and several attacks of asthma in the same individual, where the auscultatory signs have had as strict and definite a correspondence with the stages, progress, and prominent symptoms of the disease, as that which I have here described.

Now, if absolute Dryness can be ever safely predicated of the respiratory passages, and can be ever safely reckoned among the pathological ingredients of their diseases, and ever clearly notified by one express symptom, it is in spasmodic asthma, of which it seems the chief pathological ingredient during its first and often most protracted stage, and is clearly notified by a widely diffused Sibilus.

I am persuaded that the natural moisture of the respiratory passages is *then* really in defect, and that Sibilus is really an index of the fact. Sibilus may then, if ever, be truly called a Dry sound. But I am not sure that the Sibilus directly results from the mere condition of Dryness; I doubt whether simple Dryness alone would naturally produce it. In consequence of its Dryness the mucous membrane may lose its elasticity, and become to a certain degree unyielding; or it may undergo wrinklings or puckerings at various spaces, or its general tumefaction may produce a narrowing of the smaller tubes, and thus present obstacles to the passage of air, and impart to it new vibrations; and hence the Sibilus.

Nevertheless, whether Dryness of the respiratory passages, or other conditions necessarily resulting from it, give immediate occasion to the Sibilus, the Sibilus may be properly regarded as the auscultatory symptom of the former. Dryness of the mucous membrane bespeaks a well-known pathological change; the other conditions are mere matters of conjecture.

Thus far I have spoken of Sibilus occurring in two forms of bronchial disease. 1st, As it intervenes among the auscultatory symptoms of certain chronic affections, characterized by dyspnœa, expectoration, and cough, instances of which are perpetually at hand to enable you to verify the fact. 2dly, As it presents itself as the sole auscultatory symptom that attends the paroxysm or agony of an asthmatic attack, when it is so marked that its presence can never be doubted. In both these forms of disease Sibilus conveys pathological and practical information of great importance.

But does Sibilus ever occur in acute bronchial or vesicular inflammation? And does it ever *so* occur as to throw essential light upon morbid processes going on, and essential light upon modes of treatment?

Inflammation of the bronchial ramifications perhaps never exists without the natural secretion of their mucous surface being either diminished or increased, and, consequently, without the accompaniment of those sounds which indicate its defect or excess; *i. e.* without Sibilus or Crepitation.

Sibilus is apt to occur at the beginning of such inflammation; and thus it corresponds with the pathological condition out of which it arises, the mucous membrane, when it is inflamed, becoming drier than ordinary before it yields a more abundant secretion.

Sibilus, too, after it has arisen, is apt to be of short duration, seldom abiding long as the *sole* auscultatory symptom of such inflammation. And herein also it corresponds with the pathological condition from which it proceeds; for the dryness of the mucous surface generally soon gives place to moisture.

Hence it happens that Sibilus is so seldom met with in practice, except with some mixture of Crepitation. The inflammation is, in truth, not submitted to our observation until the stage of *dry* sounds is passing, or has already passed, into the stage of *moist* sounds.

Nevertheless, there are cases in which Sibilus is the sole and abiding symptom derived from Auscultation, and a dryness of the air-passages the sole and abiding morbid condition. They are cases distinct from asthma — cases of genuine inflammation, and so remarkable as to require an especial notice.

I have met with a frightful affection in children; but what its nature was I could never tell, until auscultation enabled me to unravel it. It commonly passes for inflammation of the lungs. But, when children have got well, they have got well so soon and so entirely, that I could never believe the disease to be pneumonia, although the symptoms seemed to indicate that it could be nothing else.

Last summer I went out of town to see a little boy, seven or eight years of age, whose life was very precious to his family. He was thought to be dying of inflammation of the lungs. I found him raised up in bed, supported by his nurse, and breathing with all his might. His skin was hot; his face flushed; and his chest heaved, and his nostrils quivered frightfully. There was no croupy sound. Whatever the disease was, it was all within the chest. I percussed the chest: it sounded well in every part. I listened: the air entered freely, and reached every cell and vesicle of the lungs; but there was not the least perception of the natural respiratory murmur: a shrill Sibilus had taken place of it altogether. Wherever you applied your ear to the chest, you might fancy you heard the piping and screaming of a nestful of unfledged birds.

But what was this disease? Surely it was inflammation largely diffused over the mucous surface throughout the bronchial ramifications, but inflammation as yet only in its *first* stage; for the air, as it passed through them, did not mingle with a particle of fluid any where, and the sound it produced was a dry Sibilus only.

But *how* inflammation yet only in its *first* stage? The boy had been already ill four days. Still it might be inflammation in its *first* stage. The boy continued ill two days longer, with the same kind and the same degree of suffering; and then, under the influence of tartar emetic, the fever began gradually to subside, and the dyspnœa to abate.

The Sibilus gradually gave way to the healthy respiratory murmur, and he was well again *without expectoration of any kind.* The inflammation began and ended with the *first* stage; and, although it continued with great severity for a week, it never got beyond the *first* stage.

This is an instance, which strikingly shows the value of Auscultation in detecting at once the state of things, about which you might go on conjecturing and conjecturing for ever what it *possibly* might be, and not gain the least assurance what it *actually* was.

In adults sometimes, but not so frequently as in children, I have met with the same evidences of acute inflammation widely diffused through the bronchial ramifications, and remaining in this its first stage for days and days together. In the mean time their mucous surface has still been dry throughout a great part of both lungs, and the ear has continued for days and days together to hear no other unnatural sound but a Sibilus. Convalescence has taken place without expectoration, and the Sibilus has given way, without the intervention of any *moist* sound, at once to the murmur of health.

But such inflammation, after lingering long in the first stage, will sometimes pass beyond it; and the whole mucous surface that was previously dry will pour forth an enormous secretion, and the widely diffused Sibilus will be changed into a widely diffused Crepitation. Still the lungs are unhurt beyond the lining membrane of the air-passages, and the patient will get well, if he be not suffocated by the enormous expectoration.

I am speaking of a disease which must be distinguished from asthma, according to the usual acceptation — a disease not habitual to the individual, and of which, perhaps, he has never suffered a previous attack. I am speaking of acute inflammation extending throughout the bronchial ramifications, and reaching, perhaps, the vesicular structure of the lungs, putting on a peculiar form, and affecting a peculiar course; but still of acute inflammation, as further evidenced by the remedies necessary for its relief.

During the last summer I saw a gentleman, who had been, two days previously, seized rather suddenly with feverish symptoms, and with the most dreadful dyspnœa. His lips were blue; he was labouring for breath, and coughing with hard and ineffectual efforts to rid himself of something which seemed to tease the larynx, but no expectoration followed.

Cupping on various parts of the chest (the state of vascular action required that blood should be drawn), and tartar emetic in frequent doses, were the remedies employed; but in the same state of agony he remained for a week, propped up in bed, striving with all his might to free himself from his oppression, coughing and endeavouring to expectorate, but ineffectually.

What was going on all this time? There was anguish enough for any disease of the most formidable name; for fluid in the pericardium; for extensive hydrothorax; for induration of a whole lung; for stricture at some orifice of the heart. A few years ago the most sagacious physician could only have guessed at the real state of disease, and probably would have guessed wrong. Such severe dyspnœa, so long continued, without expectoration, would probably have determined his diagnosis to hydrothorax.

But what was the disease? Every part of the chest sounded well to percussion. The heart beat regularly, and with a natural sound, only with too great frequency.

What could it be? There reached the ear from every part of the chest to which it was applied a loud Sibilus. The disease was an inflammation largely diffused through all, perhaps, of the bronchial passages, great and small; inflammation abiding long in its first stage, and limiting itself to one structure.

But in this case the inflammation ultimately passed beyond its first stage; for ultimately there arose an immense expectoration, and so the disease reached a favourable termination.

I have said that it is the peculiar praise of auscultation, not merely to discover disease in its ultimate results, but to analyse it in its several processes as it goes on; to mark its stay and continuance in one process, and its passage and transitus from one to another. Here we have a conspicuous instance of both these circumstances discovered to us by Auscultation.

It is, I suspect, among the characteristics of inflammation, that, in proportion as it is more widely diffused, it should be less rapid in its progress; not necessarily less severe, as far as severity is measured by force of vascular action and by fever, but less rapid in accomplishing its whole course; dwelling longer in each particular stage before it passes to another, than the inflammation which begins at a point.

Of this we have an example in acute rheumatism, which is diffused over similar structures in many joints simultaneously. In acute rheumatism, action and suffering are carried to the utmost degree of severity. There are extreme heat, and extreme pain, and extreme vascular action, in the parts, and in the constitution at large; yet all are expended upon one stage of inflammation.

Rheumatism may exist for weeks and months together, with all its pain, and heat, and vascular action, unabated. Chronic in duration, but most acute in what respects action and suffering, it should seem that any length of time was permitted to it to do all that inflammation can effect within *a certain* limit, but that it was restrained by a strong, though not an invincible, law, from transgressing *that* limit, or doing harm beyond it.

After many weeks or months the inflammation will cease, and every joint be restored to the form, and feelings, and functions, of health.

Such inflammation may exist in internal parts. (I do not mean rheumatic inflammation. Do not let me perplex you with a name. I only refer to rheumatism as to something well known, for comparison's sake, or analogy.) Inflammation, I say, may exist in internal parts, which (like rheumatic inflammation of the joints) is of a diffusive character, and occupies a large extent of surface at once, travelling tardily from structure to structure, slow to disorganize, abiding long in each of its stages, and giving leisure for the application of remedies in all of them. Such an inflammation is especially incident to the lungs; and, of the pulmonary structures, especially to the mucous membrane which lines the air-passages.

I have given instances of such inflammation of the bronchi lingering in *its first* stage, its stage of mere vascularity and defective secretion; and I have dwelt upon these instances for the sake of showing you the real value of Sibilus as a pathognomonic sign. But for it, in the instances specified, I could not have made out the nature of the disease.

Of Sibilus I will venture to observe, that sufficient regard has not yet been bestowed upon what it is *in itself.* It is usually spoken of as conducting to Crepitations, and mixed with Crepitations, or moist sounds. But there wants some illustration of it in its separate import, as standing alone. To that illustration what I have said may, perhaps, contribute a little.

LECTURE IX.

ON THE DOCTRINE OF SYMPTOMS.

CREPITATIONS, OR MOIST SOUNDS, THAT ATTEND THE ACT OF BREATHING. — LARGE AND SMALL CREPITATIONS. — THE DISTINCTION OBVIOUS AND USEFUL IN ITS MAIN CHARACTERISTICS — UNCERTAIN AND USELESS IN ITS LESSER DEGREES. — CREPITATIONS THE MOST FREQUENT OF ALL AUSCULTATORY SIGNS. — WHAT THEY CAN, AND WHAT THEY CANNOT, TEACH. — HOW THEY NEED OTHER AND MORE GENERAL SYMPTOMS TO INTERPRET THEIR MEANING. — ILLUSTRATED BY ACUTE INFLAMMATION OF THE LARGER BRONCHI — OF THE SMALLER — BY THAT INFLAMMATIOM OF THE BRONCHI WHICH ACCOMPANIES DISEASES OF THE HEART — BY THAT WHICH SIMULATES PHTHISIS — BY THAT WHICH IS CALLED PERIPNEUMONIA NOTHA. — HOW MUCH IN EACH CAN BE INFERRED FROM THE KIND AND EXTENT OF THE CREPITATIONS. — THE CREPITATION CHARACTERISTIC OF PNEUMONIA.

THE sounds produced by the meeting and mingling of air with fluid in the bronchial tubes during the act of respiration, I have called Crepitations; and of Crepitations I have made one distinction only, large and small.

Between the largest of the large and the smallest of the small there are many intermediate degrees; and some of these may perhaps seem to deserve a name. But, for my own part, I always have had a great unwillingness to multiply names, especially where things are essentially the same, and differ only in being greater or less; therefore I cannot bring myself to invent several names to designate different degrees in the present instance.

But though the extremes are far apart, yet in the midway large and small Crepitation will so nearly meet, that there must often be a doubt which is which; and what one man calls large, another will call small. Language, however, will afford no remedy where the difficulty is in the thing itself. You can only accurately distinguish things when they are some way apart, and not when they lie close upon the confines of each other. You can distinguish between light and darkness, but you cannot put a mark upon the boundary between day and night.

Large Crepitation arises from air meeting and mingling with fluid in the larger bronchi; small Crepitation from the same conditions in the smaller bronchi and the vesicles of the lungs. This is an important distinction, and I desire to make much of it: important, however, in its main and prominent characteristics, but useless if it be refined into many degrees.

Without wishing to enter upon a criticism of nomenclature, I would further remark that, in giving names to auscultatory signs, we should take especial care that the names themselves do not imply any thing that is erroneous; and that they do not go beyond the truth, in pretending to designate that which they *certainly cannot* designate.

What I call "large Crepitation" is called by most French writers "râle muqueux," and by most English writers "mucous rattle." Call it râle, or rattle, or Crepitation, or what you will; but pray do not add "mucous" to it by way of specific difference; for this term must always seem to imply that the sound is produced by air passing through *mucus;* whereas it is produced equally by air passing through mucus, or pus, or blood, or any fluid whatever. Besides, it is beyond the truth to say that the *quality* of the fluid through which the air passes *can* be distinguished by the quality of the sound that results. The sound will indicate the *situation* and quantity of the fluid, and no more.

Therefore, by whatever name you choose to designate the moist sounds arising from the bronchial passages during respiration, be it Crepitation, râle, or rattle, you cannot distinguish it by any other epithets of more precise meaning than "large or small," without implying more than you intend, and that, too, something erroneous, or something beyond the truth.

Crepitation, or the sound which shows that the moisture of the bronchial passages is in excess, is the commonest of all auscultatory signs. Go round this hospital, and, out of the five hundred and more patients which it contains, you will probably find Crepitation in forty or fifty. And in all these it arises immediately from one and the same condition; viz., from excess of fluid in the bronchial tubes or in the vesicles of the lungs.

But all these patients cannot, in any just sense, be said to have the same disease, because a single pathological condition is the same in all. Neither, on that account, will all be found to demand the same treatment.

I speak of disease and treatment in the largest and most comprehensive sense.

Now the forty or fifty patients, who have all Crepitation of their lungs, are not suffering alike in *other respects.* And *these other* respects in which they differ include the great characteristics of their diseases, and the special indications of their treatment.

At present I am speaking only of *direct symptoms,* immediately referable to the part affected. When I come hereafter to speak of *indirect* symptoms, or those which, originating in one part, declare themselves through the medium of another; and of general or constitutional symptoms, the signs of the pulse, and of febrile and nervous affections in their various kinds and degrees; then I will endeavour to show that many diseases, apparently local, have a much larger range throughout the body, and that the treatment which is to compass their cure must be alike comprehensive in its influence.

Learn, however, all that is capable of being known concerning the *mere* part. Let the patient tell you how it feels amiss, and ascertain for yourselves how it acts amiss; and if it be a part within reach of the sight, the hearing, or the touch, make out what changes of structure it has undergone. Still its sensations, its functions, and its structure, will only half inform you what are the essentials of the disease it suffers.

Remember, there is a pathology of diseases *beyond* the part, as well as a pathology of diseases *within* the part; and that the things beyond it are really and practically the great interpreters of the things within it.

Remember, there is a great vascular system, and a great nervous system, and that these, according to the manner in which they are actuated, assign a character to the local disease, and determine its treatment accordingly. Concerning the disease, they tell us what is its force of action, and what its rate of progress; and, concerning its treatment, they teach us to choose the remedies, and so to regulate their impression as to counteract this force of action, and to keep pace with this rate of progress.

Bearing these considerations in mind, you will be able to comprehend what I mean by saying, that the many patients in this hospital who have

Crepitation as a common auscultatory sign, and redundant fluid in the bronchi or pulmonary vesicles as a common pathological condition, may nevertheless have different diseases. And, still bearing them in mind, you will now be able to follow me as I run over a few prominent distinctions.

Among the many who have this auscultatory sign, in some it has endured for weeks or for months, and in some it has sprung up since yesterday. In some it is accompanied by much fever and great vascular action, and life itself seems already in peril, although it has existed but for a few days.

In some it is accompanied by less fever and less vascular action, and there is yet no peril of life, although it has existed for many weeks.

This Crepitation is present in rheums and catarrhs, and chronic coughs, which cleave to old people, from the end of autumn to the beginning of spring, with little or no fever.

And it is seldom absent in chronic diseases of the heart; and here it is found sometimes with and sometimes without fever, or any signs of inflammation; as if the bronchial surface had the power of *simply* increasing its secretions for the relief of a burdened and baffled circulation through the lungs.

Crepitation also is a frequent accompaniment of pulmonary hæmoptysis, with or without fever.

Now, while the great constitutional symptoms are our paramount guides to the knowledge and treatment of the disease as a whole, it is to *this Crepitation* that we are to look, in each particular case, for the knowledge of what the disease is in the lungs; its exact seat, its extent, and the stage of its progress.

The case is one, perhaps, in which there is much fever and great vascular action; while cough and dyspnœa, and some expectoration, denote the lungs to be the part upon which the inflammation has specially fallen.

We auscult, and discover Crepitation: and the Crepitation has one main and prominent characteristic; that it is large. It is *large*, and *large* exclusively; while through it, wherever it is heard, the respiratory murmur is also heard in every part of the lungs.

Such auscultatory Signs denote the mingling of air with the matter of morbid secretion in the larger bronchial tubes, and in them exclusively; the lesser tubes and the vesicular structure of the lungs, the seat of the respiratory murmur, being entirely free.

But the much fever, and the great vascular action, declare this condition of the bronchi to be the work of severe inflammation, and of inflammation that is still going on. Yet, while Auscultation continues to show that such is exclusively the seat and limit of the inflammation, severe as it is, we are warranted in expecting a favourable result; provided always that we pursue a just treatment. For even the acutest inflammation of the larger bronchi is unapt to extend itself to other textures, or to involve the structure of the lungs beyond those bronchi themselves.

But the case is one, perhaps, in which there are the same constitutional symptoms bespeaking the disease to be inflammation, and the same local symptoms, fixing that inflammation upon the lungs. But withal, the Crepitation heard during breathing is *small*, and *small* exclusively; and this small Crepitation, wherever it is found, has entirely obliterated the respiratory murmur.

Such auscultatory Signs denote the mingling of air with the matter of morbid secretion in the lesser bronchial tubes, or in the vesicles of the lungs.

In the former case, the disease was acute inflammation, and it is no more than acute inflammation in this. We have the same means of subduing inflammation in this which we had in that, and the same plain indications to direct our treatment; and the disease, *in its own nature*, is as amenable to remedies *here* as it was there. Yet are we *not* warranted in forming the same expectation of a favourable result. Because inflammation of the lesser bronchi, unlike that of the larger, is ever ready to pass beyond them to other textures, and to involve the whole structure of the lungs.

Where you have small Crepitation one day, you may find that it has entirely ceased the next; and ceased, not to be replaced by the respiratory murmur, but by absolute duluess and total obliteration of sound.

And what is implied by this rapid change from small Crepitation to total obliteration of sound? Even this; that the bronchial ramifications and vesicular structure are so pressed upon, from within and from without, by the effused products of inflammation, by serum, or lymph, or pus, or blood, or a mixture of all, that air cannot enter, and the lung has become solid at that part, and may possibly have undergone irreparable disorganization.

Let it not, then, be esteemed a small thing, that, upon rational grounds, and by tokens which we can justify and explain, we are able to arrive at this diagnosis; that, in the severest inflammation of such an organ as the lungs, we can mark the cases which are within the probability of a perfect cure, and those which are beset with the most perilous hazards.

To distinguish between inflammation of the larger bronchi and inflammation of the smaller, or of the vesicular structure, is still important in all its degrees, and whether it be chronic or acute; and auscultation will always enable us to do so.

Chronic inflammation of the larger bronchi, after months and years, is still reluctant to extend itself to other structures; whereas chronic inflammation of the lesser bronchi is always ready to spread beyond its original seat.

The most frequent instances that I meet with, of inflammation, slight in degree and chronic in duration, affecting the lesser bronchial tubes, and producing effusion into them, are those in which it accompanies chronic disease or disorganization of the heart. It is evidenced by small Crepitation proceeding from a considerable space at the lower part of one or both lungs, and often continuing to be heard for months and months together. Thus, even for months and months, the lung may remain quite pervious, but crepitating. Yet there is no security, in the mean time, that what is pervious and crepitating to-day, may not be absolutely impervious and dull to-morrow. In point of fact, I have known, by the test of auscultation, nearly a whole lung become condensed and solid in the course of a single night, when there has been nothing to give warning of such a catastrophe.

Indeed, in the dissection of those who die of diseased hearts, we are accustomed to find the lungs generally loaded with serous and sanguineous effusions, while some portions of them are solid and impervious, and sink in water.

But chronic inflammation of the larger bronchi, after months or years, is still, I have said, reluctant to extend itself to other structures. After months, or years, Auscultation still finds it in its original seat; the air bubbling through a thickish, copious, puriform fluid, and producing the truest form of large Crepitation.

There is a form of Chronic Bronchitis, in which all the conceivable signs of Phthisis are present except the auscultatory; emaciation, hectic fever, cough, and a copious thick yellow globular expectoration. Yet the chest sounds well every where upon percussion, and the auscultatory sounds are *purely bronchial*, and nothing more, and proceeding from the bronchi in their first divisions, and not beyond them; large, not small Crepitation; but large Crepitation widely diffused, and permitting the respiratory murmur to be heard every where through it.

Here the *larger* bronchi alone are inflamed, and filled with the matter of morbid secretion, while the lesser bronchi and the vesicular structure of the lungs are free. There is, moreover, no cavity.

It would be beyond the power of the most sagacious physician upon earth, *without the help of Auscultation*, to distinguish this case from a case of phthisis; but by *such help* we not only determine this disease, which is so like phthisis, to be no phthisis at all, but we pronounce it curable; that is, curable in its own nature, although from circumstances not always cured.

Cases of this kind—cases of chronic bronchitis, in which all the conceivable signs of phthisis are present except those which indicate vomicæ—are not common: I see a few of them in the course of the year.

They are more frequent, to my experience, in the hospital, than in private practice. The disease usually begins in a catarrh, which, from neglect or unavoidable exposure, is aggravated into a similitude of phthisis. Under this similitude it may endure even for a year or two; and it becomes difficult of cure in proportion to its continuance.

But, where there is Crepitation, it need not necessarily be of one kind only. In the same patient you may hear at one part of the lungs a Crepitation like the tracheal rattle of the dying; at another, like the bursting of large bubbles on the surface of water; at another, like the crackling of salt thrown upon hot embers.

There is a disease which was first called by Sydenham *Peripneumonia Notha*, and which is still known by that name. It is, in fact, a diffused inflammation of the bronchial tubes, chiefly incident to old people. One of its peculiarities consists in the enormous secretion that is poured forth from the mucous surface; and another which I have remarked is, that the inflammatory symptoms often still remain, nay, often continue to increase, after the secretion is freely established. This latter peculiarity (if auscultation informs me aright) is derived from the fact, that inflammation does not arise at once and simultaneously upon the whole surface which it is destined to pervade, but travels over it progressively; so that various portions of the same continuous surface are in different stages of inflammation at the same time. How possible this is, every one knows, who has watched erysipelas travelling over the whole body.

Cases of Peripneumonia Notha I recommend to you as special studies for Auscultation: here you will often find, in the same patient, every modification of those sounds which are produced by the matter of morbid secretion mingling with air in the bronchial ramifications of every size, from the largest to the least.

The common opinion is, that old people die of Peripneumonia Notha simply because they have not power to bring up the large accumulation of phlegm; implying, that the whole disease is limited to the first divisions of the bronchi, and that if they were freed from obstruction, there is nothing beyond them, nothing in the condition of the lungs elsewhere, capable of producing death. Doubtless, it is quite possible that accumulated secretion of any kind in this situation may be the whole and sole cause of death: it may suffocate by its very quantity. But this I know, that since

I have had Auscultation to help my inquiries, I have never seen any one perish of Peripneumonia Notha, in whom there was not elsewhere within the lungs enough to claim a large share in producing his death.

But I find myself speaking of Auscultation too much in detail for the purpose I have in view. In these lectures I would rather wish to give you such a notion of the general bearings of this and that subject, as will help you to follow it up for yourselves in the wards of the hospital. *Here* I am not so much striving to teach, as I am encouraging you to learn.

There is a Crepitation which consists of the *smallest* conceivable crackling—a noise like the crackling of salt thrown upon burning coals. This is regarded as the characteristic Crepitation of Pneumonia, because, wherever it exists, it is always for a short period only; and it is quickly followed either by the return of the natural respiratory murmur, or by the absence of all sound whatever. In the one case the passage of air through the vesicular structure of the lung has again become free, and a resolution of the disease has taken place; in the other case the passage of air is altogether precluded, and the disease has passed into its next stage, and has condensed the lung.

There is a doubt in *what* manner this particular sound is produced, and *where*. Some conceive it to proceed from the structure of the lung exterior to the bronchi and vesicles, and to result from the tearing of parts asunder that have been united by effused lymph. It may be so; but the fact would be extremely difficult to prove. To my ear the sound is the same in kind with those which I have described by the generic term Crepitation. Of these it is the smallest in degree, and probably proceeds from the same continuous surface, from the extreme vesicles and air-cells of the lungs; and is probably formed in the same manner, by the mingling of air with the morbid secretion which it finds there. This little crackling sound, so well known to those whose experience has taught them to appreciate Auscultation in its practical use,—this little crackling sound, reaching the ear from a limited and circumscribed space within the chest, marks the commencement of Pneumonia. It is a *direct symptom*, having immediate reference to the structure of the part. And if we consider what the part is, and what the disease,—the part the lungs, and the disease inflammation,—we cannot too highly value this single symptom (simple and mean as it may seem), which gives the earliest and surest intimation that such a disease has begun as tends to disorganization and the inevitable loss of life, unless quickly arrested by its counteracting remedy.

But Ausculation, having detected inflammation of the lungs at the point where it begins, still follows it as it spreads; and it follows not merely its progress, but its processes.

The Crepitus commencing at a small space, and gradually reaching further and further, gives notice of inflammation gradually passing from lobule to lobule, and effusing fluid into their vesicles as it spreads. Then the Crepitus becoming fainter and fainter, but not replaced by the respiratory murmur; and the spaces in which it was first heard becoming dull, and larger and larger spaces becoming dull in succession, until not a sound of respiration, either healthy or unhealthy, proceeds from, perhaps half the chest; these striking phenomena give notice how the vesicular structure of a whole lung is progressively obliterated by the effused lymph and morbid products of the still unarrested inflammation.

Thus far the intimations of the ear keep pace with the progress and processes of an acute attack of Pneumonia. Auscultation pronounces the permeable lung converted into a solid mass, and admitting no air, save what may just enter, and immediately return from, a bronchus or two which still remain pervious. Beyond this point Auscultation cannot go; but the disease may go further.

This is a painful period of suspense in every case of Pneumonia, when a whole lung, or a large part of it, has ceased to admit air, and the patient still survives.

The disease (I say) may go further than Auscultation can follow it. Auscultation only discovers that the lung does not admit air; that it has become solid from having been permeable. But its texture may be softened; its cohesion destroyed; and it may be reduced to a state of pulp and rottenness, which is irreparable.

But if its texture be *not* thus disorganized, it is yet capable of reparation; and then, the inflammation having ceased, Auscultation beautifully takes up its part again, and gives the first notice of reparation, as it gave the first notice of disease. Crepitation again begins to be heard where there was no sound; at first in a small space, and then more extensively; and then some vesicular breathing is mixed with it; and the respiratory murmur and the Crepitation seem as if contending with each other for the mastery, until the respiratory murmur is predominant; and then all is well.

And what is going on all the while within the structure of the lungs? Even this. The lymph within and around the pulmonary vesicles is gradually absorbed, and the air gradually finds admission within them. At first, it is impeded by the extravasated fluid it meets with in its passage; but as the permeable texture of the lungs gets disentangled and set free, it glides through them unobstructed and alone, and with the genuine murmur of health.

LECTURE X.

ON THE DOCTRINE OF SYMPTOMS.

BRONCHIAL RESPIRATION AND BRONCHOPHONY.—DRY SOUNDS—WHERE AND HOW THEY ARE PRODUCED—INCIDENT TO SEVERAL DISEASES—PECULIAR TO NONE.—THEIR ANALOGY TO CERTAIN SOUNDS OF THE HEART IN THE MODE OF THEIR PRODUCTION.—ESTIMATE OF THEIR VALUE AS DIRECT SYMPTOMS.—THEIR VALUE RELATIVE, NOT ABSOLUTE—AND LITTLE OR GREAT, ACCORDING TO CIRCUMSTANCES—AS SEEN IN PHTHISIS, IN PNEUMONIA, IN PLEURISY.

UPON the subject of Auscultation, hitherto we have only considered certain sounds occurring during the act of respiration, and have endeavoured to estimate the amount of the information they furnish concerning diseases of the lungs, both by themselves and by their interference with the respiratory murmur. And we have found that arising, as they do, from certain pathological conditions of the mucous membrane which lines the air passages, they become *direct* symptoms of all those pulmonary diseases into which such conditions enter as ingredients.

The sounds which I have called Rhonchus and

Sibilus, and large and small Crepitation, in the sense the terms bear at this hospital, and which others have called by other names bearing an equivalent sense, these sounds cannot carry us further in the diagnosis of pulmonary diseases than I have pointed out. Other sounds are required to detect pulmonary diseases consisting of other pathological conditions, or occupying other structures.

Of the other sounds, some still respect the respiration, some the voice, and some the act of coughing. There are what are called the Bronchial Respiration and the Bronchial Voice, or Bronchophony; and as Bronchial Respiration and Bronchophony will always be found to denote the same thing, I will consider them together.

When there is Bronchial Respiration you hear the breathing, and when there is Bronchophony you hear the voice, as you never hear them when all is healthy. In health, the respiration reaches the ear through the chest, in a clear, smooth, uniform murmur. In health, the voice does not reach the ear at all through the chest, except when it is applied just opposite the first divisions of the trachea — viz. on either side the second and the third dorsal vertebræ. But in certain conditions of disease you perceive at particular situations of the chest, while the patient breathes, audible *gusts* of air puffed in and puffed out of the lungs, instead of the smooth respiratory murmur; and at the same situations, while the patient speaks, a sort of humming or muttering, but no articulate word. Such is Bronchial Respiration, and such Bronchophony.

Now these sounds, accompanying the respiration and accompanying the voice, are called Bronchial, because they are formed in those first divisions of the air-tubes which are technically called Bronchi. But the Bronchi themselves are not in fault; they need not themselves have undergone any disease or change of structure whatever, in order to the production of these sounds.

Bronchial Respiration, or Bronchophony, arises when the lungs have undergone such changes of condition as are calculated to render them better conductors of sound than they are in their natural and healthy state.

Now there are so many diseases and so many morbid processes involved in, or contingent upon, those diseases, which have the common effect of rendering the lungs more solid, and thus augmenting their capacity of conducting sound, that Bronchial Respiration and Bronchophony cannot be diagnostic of any one in particular. The lungs are consolidated in phthisis by tubercles; in pneumonia, by effused lymph; in pulmonary apoplexy by effused blood; in hydrothorax and empyema, by compression, from without, of accumulated serum and of pus; — and in each of these affections, Bronchial Respiration and Bronchophony are apt to occur. But they are not properly diagnostic either of phthisis or pneumonia, of pulmonary apoplexy or pleurisy.

In going round the hospital, I have often taken occasion to point out to you cases of phthisis, in which the sounds of the heart were audible over the entire chest, or a considerable part of it. With the sounds themselves, their kind, their rhythm, their succession, no fault was to be found; only they were heard beyond their natural limit, and were perhaps a little louder than natural. The impulse of the heart, in the mean time, has not been remarkably strong; perhaps it has been remarkably feeble, and the general state of the circulation has not indicated disease.

In such cases, where, during life, the sounds of the heart have been heard thus constantly and habitually beyond the præcordial region, I have found, upon examination after death, that the organ itself has not exceeded, and often that it has fallen short of, the natural and average dimension.

When the heart is perfectly healthy, it must depend upon conditions exterior to itself, if the sounds which accompany its contraction be heard not only in the præcordial region, but both there and beyond it. In the cases I have mentioned, it depended upon the condition of the lungs; which, being rendered more solid by the tubercular matter within them, and becoming better conductors of sound, conveyed the sounds of the heart extensively through the chest.

In particular instances of phthisis, where the patient has been long under my observation, I have sometimes remarked that the audible limit of the heart's sounds has varied from time to time, according to circumstances, which seemed to me not difficult to explain. During the first stages of the disease, and in proportion as the lungs have been more and more beset with *crude* tubercles, they have reached further and further beyond the præcordial region; during the later stages, and in proportion as the tubercles have been more and more changed into vomicæ, they have receded more and more within their proper bounds.

And not in Phthisis only, but in other and curable diseases within the chest, are examples found of the sounds, which accompany the heart's contractions, being conveyed beyond the præcordial region, while the lungs are rendered more solid by the various products of morbid action; and again receding within that region when reparation has taken place, and the lungs have again become pervious and free. Pneumonia, pulmonary hæmorrhage, and pleurisy, will often, during their progress, conduct the sounds of the heart over half the chest; and the cure of pneumonia, pulmonary hæmorrhage, and pleurisy, will often bring them back again within their just limits.

In like manner, and for the same reasons, and under the same conditions of disease, do the *bronchi* acquire a resonance, or a voice, which in nowise belongs to them when the surrounding structures are perfectly healthy.

Such I believe to be the true account of Bronchial Respiration and Bronchophony. They are dry sounds, according to the explanation already given, being not produced by the mingling of air with fluid.

It now remains to determine the value that belongs to Bronchial Respiration and Bronchophony, as auscultatory Signs. If they be taken *absolutely* and *alone*, their value cannot be rated very high; for, inasmuch as they do not attach themselves to any single morbid process, but result from conditions that are common to many, they can never be *exclusively* trusted for the diagnosis of disease; yet they may be trusted very often for lending important aid towards it. In truth, their value consists rather in what they contribute as auxiliaries to other signs than as standing alone.

As auxiliaries, their value varies very much, according to the circumstances of the particular case, and as other auscultatory signs present are more or less precise, and stand less or more in need of that confirmation which these are capable of contributing.

Bronchial Respiration and Bronchophony are worth very little in Phthisis, when Gurgling Respiration, and Gurgling Cough, and Pectoriloquy, have already put their authentic stamp upon the disease.

They are worth very little in Pneumonia, when the respiratory murmur has been gradually overcome by small Crepitation, and small Crepitation been succeeded by dulness, and no sound is now elicited by percussion, or yielded to the listening of the ear.

They are worth very little in Pleurisy, when already, over one half the chest, the ear detects no respiratory murmur, and percussion can produce no Resonance; when the heart is pushed from its proper seat, and the patient is fixed on this side or that, by a dread of suffocation if he move to the other.

Yet it may happen in these several diseases, that the Bronchial Respiration and the Bronchial Voice may throw just that light which is needed upon a number of doubtful symptoms, and give just that guidance which is required to a right diagnosis.

Phthisis may exist; but you cannot certainly pronounce that it exists, though the flesh may waste and the strength decline, and the pulse be habitually more frequent than natural, and the breathing be habitually a little hurried, and some cough be habitually present without expectoration; from all these circumstances you cannot pronounce the disease to be certainly phthisis; you still need the help of some auscultatory Sign to decide your diagnosis. But a little help is *now* enough. If the Bronchial Respiration or the Bronchial Voice be *now* added, and be always present, and always found in the same place, you may securely trust either one or the other as the sure index of phthisis.

Yet bronchial respiration and bronchophony are not *absolutely* diagnostic of tubercles or vomicæ, or of any morbid process essentially phthisical. But it is enough that in this case they are *circumstantially* diagnostic; for as such they are infallible.

Pneumonia may exist; but you can have no sure evidence of its existence, though fever be present, and Small Crepitation be more or less diffused through the lung. But if to this Crepitation Bronchial Respiration or Bronchophony be added, these, which are but indirect symptoms of condensation of the lung, are, *under the circumstances*, as certain tokens of such condensation having already begun, as if the chest at some part already yielded no sound to percussion; and none, either healthy or morbid, to the application of the ear. Small Crepitation is, indeed, the auscultatory sign of inflammation in the smaller bronchial ramifications; yet as long as this is the *only* auscultatory Sign, there is a hope that the inflammation may pass away without involving structures beyond them. But Bronchial Respiration and Bronchophony *are* enough to show that it has involved other structures, and that air is admitted less freely into the pulmonary vesicles.

In cases of Pneumonia, Bronchial Respiration and Bronchophony will sometimes precede, by no inconsiderable period, those auscultatory signs which more directly declare an impervious state of some portion of the lungs. And in cases of Pneumonia, Bronchial Respiration and Bronchophony will often exist at one part of the lungs, while Crepitation still exists at another: whereas dulness to percussion and to auscultation do not arise until the Crepitation has ceased, and then are found exactly in those situations where the Crepitation was before. Bronchial Respiration and Bronchophony seem to denote the growing incapacity of the general pulmonary vesicles to admit as much air as they ought: dulness to percussion and auscultation show the exact portions of the lungs that are absolutely impervious.

Pleurisy may exist. Fever, dyspnœa, and pain in the side, are enough to create a strong suspicion of it; a *suspicion*, however, and no more. But only let the least auscultatory sign be added, and the suspicion becomes a certainty. Bronchial Respiration, or Bronchophony, is as much as you want. One or the other, found in any part of the affected side, and known not to have been there before, will at once fix the character of the disease. They show *absolutely* that the lung is beginning to suffer compression; and they show *circumstantially*, i. e. by their union with fever, dyspnœa, and pain in the side, that the compression in the present case is from fluid effused into the cavity of the pleura, which is the first effect of its inflammation.

But wait a little in this case; and if the inflammation be not arrested, and if the effusion within the pleura increase, the Bronchophony will be attended by a peculiar echo. And this echo (if echo it be) is the very pathognomonic sign of Hydrothorax. It has been well likened to the bleating of a goat, and therefore called Œgophony. But it is a sound that admits of varieties, and has been denoted with equal propriety by several similitudes.

Wait yet a little longer; and if the fluid still increase, the Bronchial Respiration, the Bronchophony, and the echo, and every the least perceptible sound, will cease.

Finally, concerning Bronchial Respiration and Bronchophony, if it be thought that they are things far too trivial to bear out such vast conclusions as, in one case, that the lungs are beset with tubercular matter, and the disease is Consumption; in another, that inflammation, either in itself or in its products, has travelled beyond the bronchial ramifications, and the disease is Pneumonia; and in another, that inflammation has fallen upon the pleura, and Hydrothorax is already begun, I repeat, that this mere Resonance of the Breathing and the Voice within the larger bronchi, is diagnostic of these diseases, not in itself, but *circumstantially*, and in the relation it bears to other symptoms.

And thus we see, in the daily practice of medicine, that things in themselves mean and of no account, do often, by their place and by their relations, gain a just preponderance over things more prominent and striking, and have the largest share in guiding our decision upon the most important questions.

LECTURE XI.

ON THE DOCTRINE OF SYMPTOMS.

CAVERNOUS RESPIRATION AND PECTORILOQUY. — DRY SOUNDS — WHERE AND HOW PRODUCED. — CAVERNOUS RESPIRATION HAS MANY MODIFICATIONS. — WHENCE THESE ARE DERIVED. — THEY CANNOT AND NEED NOT BE CHARACTERIZED BY NAMES. — CONDITIONS MOST FAVOURABLE TO PECTORILOQUY. — GURGLING RESPIRATION AND GURGLING COUGH. — MOIST SOUNDS — HOW AND WHERE PRODUCED. — THESE FOUR AUSCULTATORY SIGNS, CAVERNOUS RESPIRATION AND PECTORILOQUY, GURGLING RESPIRATION AND GURGLING COUGH, ARE CHIEFLY CONCERNED IN THE DIAGNOSIS OF PHTHISIS. — ESTIMATE OF THEIR VALUE AS DIRECT SYMPTOMS IN EACH STAGE AND FORM OF THIS DISEASE.

But there are other auscultatory Signs which respect the respiration and the voice; those, namely, which are called Cavernous Respiration, and Pectoriloquy. I will consider them together, as I did Bronchial Respiration and Bronchophony, because they too will be found to signify the same things.

We call it Cavernous Respiration when, during the act of breathing, a hollow sound reaches the ear through the walls of the chest from some circumscribed space within. And we call it Pectoriloquy, when, during the act of speaking, the articulate words that are uttered reach the ear through the walls of the chest from a circumscribed space within.

Cavernous Respiration and Pectoriloquy both result from a cavity formed in the lungs, and communicating with the bronchi. They are, in the sense already explained, Dry Sounds — *i. e.* not requiring the presence of fluid for their production.

In Cavernous Respiration the hollow sound probably does not begin to be formed until the air enters the cavity, and results altogether from reverberation against its sides; whereas in Pectoriloquy the articulate sound is first formed in the larynx, and then conducted down the trachea, and, entering the cavity, is merely augmented by reverberation against its sides.

I am convinced that the whole subject of Auscultation would have been better understood if a little less artifice had been used in the methods of teaching it — a little less industry to find a name for every sound that is heard. This very sound of Cavernous Respiration has been puzzled and perplexed to the student by the fancy of giving an express name to each of its modifications.

There may be, perhaps, now in the hospital, a dozen patients who have Cavernous Respiration; and in each one of them the sound, besides being cavernous, has some distinct peculiarity; it is large, or it is small; it is a click, or a hum, or a squeak.

It is like blowing into a bottle with a narrow neck, or into one with no neck at all; it is like the flapping of a valve; it is metallic; it is as if air was puffed *into* your ear, or as if air was drawn *from* it.

It would be easy enough to agree upon a dozen terms to designate the dozen different sorts of Cavernous Breathing in the patients now in the hospital; but then the next dozen patients would require as many new terms for as many new sorts of Cavernous Breathing, which would still be different.

The varieties of Cavernous Breathing are doubtless owing to different sizes and forms and situations of cavities, and to different conditions of the surrounding lung.

A cavity may be very large or very small. Several bronchi may open into it, or only one. It may be a simple cavity, or it may have many chambers. Its sides may be condensed and equal, or rough and ragged. The lung around it may be solid and indurated, or pervious and vesicular. It may be near the ribs, or far from them; adherent to, or separate from, the pleura.

It is quite obvious that these different circumstances are calculated to modify the sound, which will, nevertheless, be always such as indicates a cavity.

Would you know what Pectoriloquy is? Put the tube upon the larynx or trachea of a healthy man, and, when he speaks, his voice will seem to come through his throat, and pass directly up the instrument into your ear. Just in this manner does the voice reach the ear through the chest, when the conditions within are favourable to Pectoriloquy.

The conditions *most* favourable to Pectoriloquy are, that the cavity should have dense walls, that it should be near the surface of the lung, and that, by mutual adhesion of the two pleuræ, the walls of the chest should themselves contribute to form it, and that the cavity itself should be empty. Thus a cavity that produces Cavernous Breathing may still not produce Pectoriloquy. It must not be too small, or it will not allow sufficient reverberation to the voice; it must not be too large, or the voice will be lost in an indefinite hum. Thus there may be a cavity without Pectoriloquy, but a cavity can scarcely exist without Cavernous Respiration.

There is yet another auscultatory Sign, which belongs to the respiration. It results from the mingling of air with fluid in the act of breathing; but it is heard in a circumscribed space, and evidently proceeds from a much larger quantity of fluid than is capable of being accumulated in the mere bronchi within that space.

The French call it Gargouillement; we call it Gurgling. It is essential to this sound that there be a cavity, and that the cavity contain fluid.

The Gurgling sound of the Respiration is exactly like that which a boy makes when he blows up soap suds with a tobacco-pipe.

Allied with the Gurgling Respiration, and requiring the same conditions to produce it, is the Gurgling Cough. I wish, however, I had another term for the sound which attends the act of coughing: for it is certainly different from the gargouillement which attends the act of breathing. If you place your ear upon the chest, immediately over a considerable cavity containing pus, or any fluid that admits air to pass through it, and tell the patient to breathe rather deeply and rapidly, you will hear the sound of a hundred great bubbles agitating the fluid and bursting in continual succession. But if you place your ear upon the chest, and tell him to cough, the sound is as if the whole contents of the cavity struck against your ear at once. The one sound is a *gurgling*, the other a *plash*. I wish Plash was not such an awkward word; for it expresses the very thing.

In the effort of coughing, more air penetrates the cavity. It goes in and out of it with a rush. Moreover, it dwells longer in it, and while it is there the whole chest suffers a succussion. Thus, by the act of coughing, not only are the air and the fluid mingled and agitated together within the cavity, but the cavity itself is shaken, like a bottle, against the ear.

This audible Plash of fluid is certainly produced during coughing, as well by the general succussion of the chest which then takes place, as by the forced impulse and agitation of air within the cavity itself. Indeed, succussion alone will produce it; and succussion occasioned by other means than by coughing. Very often, when the cavity has been close to the walls of the chest, and the patient has been much emaciated, after I have heard its contents Bubbling as he breathed, and Plashing as he coughed, I have desired him to hold his breath for a few seconds, and abstain from coughing if he could; and still I have heard distinctly a smaller sound of the same kind, a Plash synchronous with the pulse. This sound is doubtless owing to the motion derived to the same cavity from the impulse of the heart, or large blood vessels.

And now for the practical application of the several auscultatory Signs; Cavernous Respiration and Pectoriloquy, Gurgling Respiration, and Gurgling Cough. To illustrate their diagnostic use I will take only one disease, but one which includes many and various morbid changes in the structure of the lungs, and see how far these signs, either by themselves or as auxiliaries to others, enable our knowledge to keep pace with such changes, as they arise. That disease shall be Pulmonary Consumption.

Let us consider Pulmonary Consumption in the stage of its first development, its most uncertain, but its most fearfully interesting stage. An individual is suspected to be phthisical: he has some fever, some acceleration of pulse, some emaciation, and some cough; all inconsiderable in degree, yet all abiding; but no expectoration.

In a patient thus suspected to be phthisical, Auscultation may discover no more than this; that beneath the clavicle and about the scapula the respiratory murmur is less clear on one side than on the other, and that, where the murmur is defective, there, too, the chest is less resonant to percussion.

Now if, after repeated examinations, Auscultation comes always to this result, no doubt can remain that Tubercles are already formed in the upper lobe of one lung.

But here is no unnatural sound, only the natural sound is in part defective; and this must arise from some impediment to the passage of air through that portion of the lungs. Now impediment may arise from the deposition of lymph, or any of the common products of inflammation, as well as from tubercular Matter. But inflammation is very unapt to take place, and its products to be effused into the apex of an upper lobe, while every other part of the lungs remains unaffected by it. It may ultimately reach this situation, but seldom, very seldom, begins in it. On the other hand, it belongs to phthisical disease to deposit Tubercles in the upper lobes first, and thence gradually to scatter them over the rest of the lungs.

Thus, by help of Auscultation, but still rather by what we do *not* hear, than by what we *do*, we arrive as surely at the persuasion that there are Tubercles in a certain case, as if there were sounds properly denoting their existence.

Always bear in mind that there are no auscultatory Signs which expressly bespeak Tubercles. You are left to get at the knowledge of their existence by that sort of evidence which has been called circumstantial; Auscultation, however, having an important share in the result. As thus, Auscultation finds the respiratory murmur defective at a certain part of the lungs; and hence we infer its obstruction by the deposition of some kind of matter or other. But the part is that which nature chooses, above all others, for the deposition of tubercular Matter; and hence we further infer that the Matter is tubercular in this particular instance. But, moreover, the constitutional symptoms are such as are wont to accompany phthisical disease; and hence we finally infer almost a certainty that Tubercles are deposited at the upper part of one lung. We conclude that the thing must be, because it *can* be nothing else. Circumstantial evidence, it is acknowledged, may be as infallible as the evidence which bears direct attestation to the simple fact.

I have been speaking of the auscultatory Signs that we possess of consumptive disease, when it has proceeded no further than the deposition of Tubercles (crude Tubercles) at the apex of one lung.

In proportion as Tubercles are more largely deposited in one lung, or extend to both, the auscultatory Signs are the same in kind, but more definite; and the portions of lung that are healthy are more strikingly contrasted with those that are diseased. The healthy part, being called upon to compensate by a more energetic respiration for the absence of respiration in the diseased, gives out a louder and more puerile murmur, while the diseased gives out no murmur, or almost none at all.

Recollect, I introduced the subject of Auscultation for the sake of illustrating to you the best means we have of knowing organic disease by direct symptoms. But, if there be any Signs, not auscultatory, which either give direct intimations of disease in the same organ, or tend to give more force and precision to the auscultatory, it is fit that I should introduce them as I go along.

At no period of Consumptive disease is hæmoptysis more apt to take place than at this which we are now considering, when the lungs are beset by crude Tubercles. And the hæmoptysis illustrates the auscultatory Signs, and the auscultatory Signs illustrate the hæmoptysis.

The cases are numerous in the course of a twelvemonth which I see in this hospital and elsewhere, of hæmoptysis occurring in every quantity, from a tea-spoonful to a pint, in individuals whose general health has been previously declining, but who have had no particular complaint except (what they have called) a little hacking cough.

The great majority of such cases, as far as the mere hæmoptysis is concerned, do well. In a few days the hæmoptysis entirely ceases, and very often the patients tell you that they are better since they spat blood than they were before. It is my habit, however, to keep such patients still in the hospital for a week or a fortnight, to satisfy myself respecting the actual condition of their lungs, as far as I can learn it by Auscultation.

And Auscultation gives the same results which have been described. Respiration is unequally performed in different portions of the lungs. There is less respiratory Murmur perceptible about the scapula, or beneath the clavicle, on one or both sides, and less resonance upon Percussion, than elsewhere.

I would invite your attention to all such cases as these, whenever you meet with them in the hospital. I recommend you particularly to exercise yourselves, whether by Auscultation or otherwise, in detecting the signs of Tubercles deposited in the lungs at the earliest possible period: because it is *then* especially that a sound knowledge of the real state of things may enable you to do infinite good; by seasonable, and (I will add) practicable advice to postpone the progress of disease, and protract many a valuable life.

I do not wish you to fasten on small points, and swell them into importance, and by refining and sophisticating to make something out of nothing at all, and frighten families, and deceive yourselves into a belief that you have cured Consumption.

The cases I am pointing out are those in which there are well-defined constitutional symptoms — fever, wasting of the flesh, acceleration of pulse. These denote something going on wrong somewhere. The cough fixes suspicion upon the chest; and the chest being examined gives such results as I have mentioned.

Let us now consider Pulmonary Consumption in other stages. In all stages, subsequent to the tubercular, the auscultatory Signs are paramount and unerring, and you may implicitly trust to them for your entire knowledge of each and every other morbid change and process incident to the structure of the lungs from Pulmonary Consumption.

The earliest and the least, but still a very authentic sign of Vomica, derived from Auscultation, is a mere Click, or slight ringing sound, heard in breathing, at some point beneath the clavicle or about the scapula, in a patient in whom all the surrounding parts have been for some time dull. This Click, to remove all suspicion of its being owing to the accidental lodgement of a piece of tough phlegm in one of the bronchi, must always be found at the same point at several examinations of the chest. It is one modification of Cavernous Respiration. It results from a cavity or Vomica in its first formation, when the tubercular Matter is softening, and it is just beginning to admit air.

Those who have been accustomed to attend me for any length of time in my visits round the hospital, must know how often I have pointed out this particular sign, this little Click in the breathing, and desired them to listen to it day after day, until they gradually found it change into a sound of a more certain character.

Where there is a Cavity, in the progress of its enlargement and of the changes it undergoes, its auscultatory Signs are to be sought in Breathing and Coughing and Talking. Breathing will give them in one case, Coughing in a second, Talking in a third. Or often in the same case, whether the patient breathe, or cough, or talk, the evidence of a Cavity within the lungs is equally authentic.

Thus the Respiration, the Cough, and the Voice, may all give equal assurance that Vomicæ exist; one confirming the other, and all agreeing in the same result.

But in particular cases, from the situation of the Vomica, from its size, from the kind and quantity of its contents, or from the state of the surrounding lung, Auscultation gives sometimes less and sometimes more notice of the disease by the sound conveyed in one of these actions than another. One is needed to supply the symptom which another does not give.

Some time ago I was desired to pronounce upon the nature of the disease, in a gentleman who was affected in this manner. He had suffered a long and abiding hectic, and had reached a state of extreme emaciation, but had a very slight cough, and expectorated only one large globule of yellow heavy matter once a day, immediately after he woke in the morning. His little cough, his little expectoration, and his ability to inflate his lungs freely and deeply, encouraged a hope that he still might not have Consumption, his abiding hectic and his extreme emaciation notwithstanding.

I examined the chest, and found the respiratory Murmur clear and loud, and vesicular. In the act of breathing there was no unnatural sound, either Cavernous or Gurgling, any where.

Having learnt thus much, or, rather, having puzzled myself thus far, I was interrupted in my further examination by some accident, and I postponed it until the next day.

The next day I could get no more information from the mere Breathing, except that, upon the whole, the air entered more freely into one lung than the other; the other, however, not wanting the Vesicular Murmur in any part. Neither from the Voice could I get more information; it was neither Cavernous nor Pectoriloquous. Percussion elicited a somewhat different sound from the space between the clavicle and mamma on one side and the other. But the sound was dull on neither side.

What, however, neither the Respiration nor the Voice could declare by any authentic sign, was made clear and manifest by the act of Coughing; viz. that there was a large Cavity, full of fluid, occupying a space in one lung between the clavicle and the mamma. For when I desired the patient to make as deep an inspiration as he could, and then to cough with all the force he was able, instantly there came Plash after Plash against my ear from the whole of this space; a sound, which could only result from the agitation of fluid in a large Cavity.

But why was there a Vesicular Murmur at this space? Probably because the Cavity, large as it was, had a considerable stratum of healthy lung interposed between it and the walls of the chest. Why was there no Pectoriloquy? These same conditions, the size of the Cavity, and the intervention of healthy lung between it and the walls of the chest, were enough to prevent it. Besides, the Cavity was full, and thus was unfavourable to Pectoriloquy.

And why, above all, was there no Gargouillement, no Gurgling sound in the respiration, and little or no expectoration? The air during ordinary respiration might not have free access to the Cavity. The Cavity was there, but there might be no considerable bronchus entering it. Or, what is most probable, a considerable bronchus or bronchi entered it, but were obstructed by some obstacle, from within or from without, before they reached it. Either hypothesis will furnish the explanation, how a large Cavity full of pus can exist in the lungs, and yet not enough of air find its way *into* it, in ordinary breathing, to produce an audible agitation of its contents, and not enough of matter find its way *out* of it to furnish more than a scanty expectoration. In this case it took the whole night, and the continual oozing of pus by some narrow passage from the cavity into the bronchi, to accumulate half an ounce ready to be expectorated in the morning.

So much for the present. But you must inquire further into the forms and stages of Phthisical Disease, if you would know the real value that belongs to the auscultatory Signs in question.

LECTURE XII.

ON THE DOCTRINE OF SYMPTOMS.

FORMS OF PHTHISIS COMPARED WITH KINDRED FORMS OF DISEASE IN EXTERNAL PARTS. — UNMIXED PHTHISIS. — MIXED PHTHISIS. — UNMIXED PHTHISIS COMMONLY OF LONG DURATION. — SOMETIMES LINGERING IN ONE STAGE, AND RELUCTANT TO PASS BEYOND IT. — SOMETIMES PASSING QUICKLY THROUGH ALL ITS STAGES, BUT OCCUPYING SMALL PORTIONS OF THE LUNGS IN SUCCESSION — CEASING IN ONE AND BEGINNING IN ANOTHER. — GENERAL AND AUSCULTATORY SIGNS OF UNMIXED PHTHISIS. — IS PHTHISIS CURABLE?

I WISH to consider some important distinctions of Pulmonary Consumption, grounded on pathology, and brought to our knowledge by Auscultation during the life of the patient.

You have all seen an absorbent gland of the neck become as hard and as large as a marble, but without pain, or heat, or discoloration of the integuments; and hard, and indolent, and marble-like, it has remained for weeks, or months, or years.

This is a mere deposition of tubercular Matter in the substance of the gland.

And you have all seen an absorbent gland of the neck hard and large, and without pain, or heat, or discoloration of the integuments, for a while; but presently pain, and heat, and redness, have arisen, and what was hard has become soft, and the integuments have become thin, and have ulcerated or burst; and pus has been discharged, and with it a hard nucleus of tubercular Matter; whereupon the swelling, heat, and pain, have subsided, and the parts have been restored without any remaining mark of injury, save a slight scar.

This is a deposition of tubercular Matter followed by inflammation in the substance of the gland. But the inflammation is restricted almost, if not altogether, to the gland itself; and it has no sooner done its work of eliminating the tubercular Matter, than it ceases entirely.

In like manner you have seen many glands of the neck remain hard and indolent, or all or several of them go on to inflame and suppurate simultaneously, or in succession. But the inflammation and suppuration have not continued longer, nor extended further, than was needful for the purpose of eliminating the tubercular Matter.

There is (what is called) the *specific* limit of a disease. By this is meant the limit proper to its local morbid action, which, for any purpose it has to accomplish, it never need to transgress.

Thus, in the instances alluded to, the specific limit of the disease was strictly preserved; for if the tubercular Matter was to be evacuated, no less degree of inflammation could have succeeded in bringing it to the surface.

But in such tubercular Affection of the cervical glands, the disease may spread beyond its specific limit. It may give occasion to inflammation both more severe and more extensive than is needed for the mere elimination of the tubercular Matter; to inflammation pervading the whole neck widely and deeply, and accompanied by diffused redness, and swelling, and pain; the whole subcutaneous cellular structure, between the angle of the jaw and the clavicle, being loaded with effused serum and blood, and numerous apertures dripping with pus.

And all this inflammation, with its destructive processes, is engendered and spread abroad from a mere nucleus of tubercular Matter in a few absorbent glands. Yet in another case this same tubercular Matter lay indolent and harmless, neither the constitution nor the part feeling any apparent inconvenience from it. And in another case it created just inflammation enough (and no more) to produce a process of ulceration which might bring it to the surface.

Behold here, upon the surface of the body, that very Disease which in the Lungs constitutes Consumption! Behold *here* transacted before your eyes the same morbid changes and processes which (allowance being made for difference of structure) are *there* transacted within reach of the ear!

There are cases in which Pulmonary Tubercles abide long, and, perhaps, never suppurate, or at a very late period; and there are cases in which Pulmonary Tubercles excite around themselves just enough of inflammation and suppuration to procure their own solution or evacuation, and no more; and again, there are cases in which Pulmonary Tubercles produce and spread abroad inflammation of every degree and every extent throughout the lungs, beyond what is necessary to produce their own solution or evacuation. And these cases are to be distinguished from one another by Auscultation. And their distinction is of vast practical importance.

Tubercles and Vomicæ are the specific part of Pulmonary Consumption. If you do not detect one or other of these, you cannot pronounce the patient to be consumptive. The auscultatory Signs which denote their existence have been already enumerated.

I shall take no notice of those cases in which a few Tubercles are deposited here and there in the lungs, without any auscultatory Sign of their existence. We find them after death, where they were never suspected during life, and where the entire lungs besides are perfectly healthy.

There are no auscultatory Signs which expressly denote Tubercles. Nevertheless, I have shown that Tubercles may be detected almost infallibly by circumstantial evidence, to which Auscultation essentially contributes. But, before they can be thus detected, Tubercles must be so largely deposited in some part of the lungs, as to impede perceptibly the passage of air through it.

Consumption is perpetually presenting itself to me in this form. An individual loses the complexion of health, and becomes thin; he coughs a little; but perhaps he has no notable fever, and no constant acceleration of pulse. I auscult his chest, and find a Dulness beneath one or both clavicles, or about one or both scapulæ, and a free respiratory Murmur through every other part of the lungs. Here there is no disease beyond Tubercles; and while they occupy the upper lobe, the whole lungs besides are without a vestige of disease.

This form of Consumption may endure for years and years, the auscultatory Signs continually denoting the same thing, and the patient getting neither a bit better nor a bit worse in the mean time. But he is a wretched invalid, and finds that there is something continually incapacitating him for the severer business of life.

To such a person it is a continual puzzle why he does not get well. He consults an infinite number of medical men; and it is remarkable that he gets no comfort or satisfaction from those who understand his disease the best, and the greatest comfort and satisfaction from those who understand nothing about it. Those, who know what it is, out of kindness do not tell him the truth, and they cannot asseverate a falsehood stoutly enough to carry any weight with it; whereas those who know nothing about it affirm boldly and unhesitatingly that *it is all stomach*, really believing that the whole and sole disorder is in the stomach, and that it is within the reach of an easy cure.

Surely Auscultation is so essential a help for arriving at the truth in such a case, that they who are skilled in the use of it always agree as to what the truth is: and, indeed, there is no wonder in *their* agreement: the wonder is, that they who do not arrive at the truth should so constantly agree in adopting the same fallacy. I have been somewhat curious in my inquiries concerning this matter, and the constancy with which I have found the whole malady imputed to the stomach has appeared to me very strange. There is, however, a circumstance in the history of these cases which gives a colour of truth to this opinion. The state of the bowels is very frequently such as to demand the continual use of purgative medicine; and the cough often comes on, and with it a kind of asthmatic breathing, soon after dinner; and both continue as long as the stomach is distended with food.

In this form of Chronic Consumption spittings of Blood are apt to take place occasionally; and, when they do, they must give fearful intimations of disease of the lungs to those who are not yet assured of it by Auscultation. But I have known *them* also imputed to the stomach.

In this form of Chronic Consumption abscesses are apt to occur by the side of the rectum, and to degenerate into fistulous sinuses.

But in this form of Consumption Vomicæ are not postponed *indefinitely:* they at length are formed, and from that time the patient sinks rapidly. Often, when a fistulous sinus has been cured by an operation, and the long abiding discharge from it abolished, an expectoration of pus will occur for the first time, and never afterwards cease.

From the first formation of Vomicæ the patient sinks rapidly. In Pulmonary Consumption, characterized by the length of its Tubercular stage (if I may so call it), and by a seeming reluctance to pass on to the formation of Vomicæ, when, after several years, Vomicæ do ultimately take place, it is often in great numbers simultaneously, or in very quick succession; so much so, that a lung which two or three weeks ago was, in a great part, dull to Percussion, and yielded no sound to the ear but Bronchial Breathing or Bronchophony, will *now* give the clearest auscultatory Signs that it is literally riddled with Cavities; and not only so, but, if the patient survive a little longer, that many Cavities have run together, and a multitude become one. The same simultaneous Gurgling when the patient breathes, and the same simultaneous Plash when he coughs, will reach the ear from half one side of the chest.

It is remarkable how to the very last the sounds are *often* properly and exclusively those of *Phthisical* Disease, or rather those which it belongs to the essential conditions of Phthisical Disease in the lungs alone to produce, and *those sounds only.* There are Cavernous Breathing, or Gurgling Breathing and Gurgling Cough, or Pectoriloquy; and in whatever parts of the lungs you have not these, if you have any sound at all, it is the vesicular Murmur of Health.

Nothing is more common, upon dissection, than to find the lungs most largely beset with Tubercles and Vomicæ; and at the same time every part of them, which a Tubercle or a Vomica does not absolutely occupy, altogether healthy.

Such is one form of Pulmonary Consumption; and it would seem to be, in many striking circumstances, distinguishable from others. I may fairly wish that I had a less accurate knowledge of it; for that knowledge first came to me from observing its symptoms in two of my most valued friends, and from watching in them, year after year, the sure but hesitating approaches of death.

But Consumption is perpetually presenting itself to me under a different character. The patient will live as long as he whose disease is slow to advance beyond the stage of mere Tubercles. His condition, however, is different; and that condition varies more from time to time: he will spit for a while considerable quantities of pus, and then cease from expectorating altogether. He will suffer hectic fever, and then throw it off, and then suffer it again; lose his flesh, and recover it, and then lose it again. Here, if you auscult the chest, you will find Cavernous Respiration or Pectoriloquy, a Gurgling Respiration or a Gurgling Cough at the apex of one or both lungs, and at every other part a clear vesicular Murmur.

These are the cases in which Pulmonary Tubercles excite around themselves just enough of inflammation and suppuration to procure their own solution or evacuation, and no more. The Phthisical Disease is carrying on its owns pecific processes within its own specific limits. It is depositing tubercular Matter, and then maturating, and softening, and evacuating it; and the result is the formation of a Vomica. But, except in the seat of the Vomica, the whole lung still remains healthy.

A very dear friend of my own was twelve years dying of Consumption; and another individual was twenty. They had expectoration, and hectic fever, coming and going during twelve and twenty years; but they died before the days of Auscultation, and, therefore, the exact condition of the lungs at different periods during the progress of their disease was not known. I know a man, now living, who occasionally spits blood and pus, and who has occasionally spit blood and pus during the last twenty years. At various times during the last four years Auscultation has discovered a Vomica or Vomicæ at the apex of one lung, but, withal, a satisfactory Vesicular Murmur in other parts. This individual, in what regards eating and drinking, has lived a life of abstinence, but a life of great toil in what regards exertion of body and mind. Sometimes his friends are full of apprehension about him; his hectic fever, his emaciation, his cough, and expectoration, seem preludes to the worst event; but again he rallies, and his mind and his body recover, or seem to recover, their wonted powers.

But in this form of Pulmonary Consumption, a time arrives at which there is no more resumption of the appearance or reality of health, no more pausing between (as it would seem) the formation of one Vomica and another. The hectic, the cough, the expectoration, continue; the emaciation increases; the strength declines; and Auscultation has no longer to seek the Gargouillement, the Cavernous Breathing, or the Pectoriloquy, in one spot, but finds them at all times any where between the clavicle and the mamma, or any where about the scapula on one or both sides.

Here, too, however, it is remarkable, as in the other form of Consumption, that the Vesicular Murmur of health is often heard to the last in all parts of the lungs besides; and upon dissection, that all parts are often found healthy which a Tubercle or Vomica does not actually occupy.

The difference between the present form of Pulmonary Consumption and the former is this—that the former lingered long in the tubercular stage, tubercular Matter continuing to be deposited year after year, but no Vomica occurring, until, at a very advanced period, many were formed simultaneously, or in quick succession, and hurried on the patient to dissolution with great rapidity; whereas in the present, the Vomica, and Vomica only, is the object recognised by Auscultation. Tubercle must precede it. But the Tubercle is hardly deposited before the process of softening and evacuating it arises, and a Vomica is the result. Thus Tubercle is formed after Tubercle (as it should seem), with some interval of time between, and Vomica after Vomica; but the Vomica is the more abiding morbid condition.

These are genuine and unmixed forms of Pulmonary Consumption; and I have dwelt upon them because they are so, and because I am indebted for my knowledge of them, as distinguished from others, to Auscultation.

Of these two genuine and unmixed forms of Phthisis, the first is unquestionably the most hopeless. Where Tubercles are largely deposited, and continue still to increase, and do not pass on to Vomicæ, there is never the smallest attempt towards a restoration to health — not even of a temporary or apparent restoration.

But where Tubercles arise one by one, or a few together, and this one or these few pass rapidly into the state of Vomicæ, — and where a pause ensues between each successive formation of Tubercles and Vomicæ, — then, during that pause, there is an opportunity for the powers of reparation to come into action; and, in truth, there often does arise a manifest endeavour after health, — an endeavour which succeeds so far as to recover some of its conditions, and to suspend the disease: and then, during that pause, there is always the hope (for where disease is suspended and health is partly recovered, we cannot help hoping) that reparation may be complete, and the disease abolished altogether.

But can this be? Does Consumption *ever* admit of cure? If ever, it must surely be when it occurs in that form which we are now considering. Let us, therefore, now give a few moments to this interesting question.

A vomica certainly admits of reparation so far as not to be a vomica any longer, but not so far as to leave behind it no trace within the lungs. It leaves behind it a scar — that is, the disease ceases in the part, but the part is not restored to the exact condition in which it was before the disease began.

In examining by dissection the bodies of those who die of Pulmonary Consumption, among many existing Vomicæ we occasionally find the traces of a Vomica healed. At the apex of the lung we find an indentation, and descending from it, for half an inch or an inch, a thick perpendicular line of tough ligamentous substance. Sometimes this substance, by being pulled asunder, is discovered to contain the remains of a cavity, and sometimes not.

But what imports this reparation of a single Vomica, if so many besides still exist? A reparation of a twentieth part of the existing disease cannot be called a cure.

But in those who have not died of any pulmonary symptoms, and who were never known during their lives to have had any symptoms apparently phthisical, the same evidences have been found after death of what once was a Vomica, but no existing Vomicæ together with it.

This is a cure, or tantamount to a cure. It is as much a cure as when a single scrofulous cervical gland goes on to suppuration and heals with a scar. A single Vomica, you may say, is as much of the essence of Consumption, as a hundred; and if the morbid structure (no matter how small) in which the disease essentially consists be repaired, the disease is cured — that is, the Consumption is cured. But it was a Consumption which nobody knew to exist.

Now all this may be very fine reasoning; but it does not meet the plain meaning of the inquiry whether Consumption be curable. It is not proof enough to common sense of its being so, that a few isolated Vomicæ, which gave no sign of their existence, should have undergone reparation.

All the world is asking us whether Consumption be curable? Indeed all the world is interested in the question: for there is hardly a family into which Consumption, sooner or later, does not enter; and when a man makes the inquiry (as it were) speculatively, or indifferently, he has most likely a real practical interest in it at home. He says, "Is Consumption a curable disease?" But he *would* say, "I have a wife or a child, a brother or a sister, who is decidedly consumptive; is there the least possible hope left me that they can recover?"

To the question proposed with *such intent*, it is a mockery to answer "Consumption is a curable disease;" because, forsooth, its entire process from beginning to end — its formation, progress, cure — may be *secretly* transacted within the body without our knowing or suspecting any thing about it.

If you ask me, as a Physician, whether I have ever had experience of a perfect and satisfactory recovery taking place, where there have been all the best known *popular* symptoms of Phthisis decidedly marked, symptoms which (*as far as they* go) no Physician could possibly say were not those of Phthisis? I answer, "Often."

But if you ask me whether I have ever had experience of the like perfect and satisfactory recovery where there were all these popular symptoms, and, withal, the conditions proper to Phthisis, ascertained by auscultatory Signs to exist beyond a doubt within the lungs? I answer, "Hitherto never."

What shall we say then? How shall we answer the popular question in the popular sense, and still answer it truly? We *cannot* say that Consumption is curable; but we *can* say (and truly) that there are cases of *imputed* consumption which put on such an aspect of the *real* disease that they are with difficulty distinguished from it, yet have not its essence. These are all within the possibility of cure.

We *can* say that there are cases essentially phthisical, in which the disease is so lingering in a particular stage, that many years are often required to bring it to its fatal termination. The decline is gradual, almost imperceptible, but sure. These fall within my first description.

And we can say that there are cases essentially phthisical (and these fall under my second description) in which the disease accomplishes its course, as it were, by parts and parcels; many times apparently beginning, and many times apparently ending, but always (as far as I see) beginning again: a year or two of disease, a year or two of health, then a year or two of disease again. Yet, upon these terms, I have known those who have passed neither a short, nor a useless, nor an unhappy life. I have known those who have so gathered up the fragments of their broken health as to make them serve for high and useful purposes, and put to shame the fewer and smaller performances of stronger men.

LECTURE XIII.

ON THE DOCTRINE OF SYMPTOMS.

SUBJECT CONTINUED. — MIXED PHTHISIS. — THE MIXED CHARACTER OF ITS AUSCULTATORY SIGNS.

I HAVE described two forms of Pulmonary Consumption, distinct from each other in certain pathological particulars, and distinct also in their auscultatory Signs. Both were specimens of genuine and unmixed Phthisis; — genuine, because they consisted of Tubercles and Vomicæ, which are the essence of the disease; unmixed, because they consisted of Tubercles and Vomicæ *only* from first to last; these fulfilling their specific morbid processes within their specific limits, and leaving all other parts of the lungs which they do not actually occupy free from disease.

These two forms of Phthisis were represented as chronic; and chronic they are generally found to be: for disease which does not easily impart irritation to surrounding structures, is usually slow in its own actions.

Observe, I am not making distinctions of Phthisical disease for purposes of mere arrangement and nosology; but I am selecting such forms of it as I find suitable to the purpose I have in hand; that purpose being to show that there is such a disease as genuine and unmixed Phthisis, discoverable by Auscultation, and distinguishable by Auscultation from *mixed* Phthisis, which is presently to be considered.

There are forms, then, of Pulmonary Consumption, which Auscultation is able to distinguish from those already described mainly in this particular circumstance, viz. that the Tubercles and Vomicæ produce and spread abroad other disease within the lungs beyond the parts which they themselves occupy, and beyond the sphere of their own specific actions; and that other disease is Inflammation. These forms are characterized during life by a mixture of the auscultatory Sounds belonging to Phthisis, and the auscultatory Sounds belonging to that other disease; by those which denote Tubercles and Vomicæ, and those which denote effusion, of whatever kind, into the bronchial and vesicular structure of the lungs; by Dulness beneath the clavicles or about the scapulæ, or by Cavernous Breathing or Bronchophony, Gurgling Breathing, Gurgling Cough, or Pectoriloquy; and, at any or every part, where these are not found, by Sibilus or large or small Crepitation.

The Phthisical disease, however, must have reached a certain point of its development, before each order of auscultatory Sounds is clearly discernible.

Hence there are cases in which the disease indeed is mixed, or of two kinds concurrently, while the auscultatory Sounds are of one kind only. The specific Phthisical disease and the common Inflammatory disease exist together; but at the same time the auscultatory Sounds present only indicate the one and not the other: and, strange to say, the sounds that *are* present often belong, not to the *primary* Phthisical disease, but to the Inflammation which is secondary and incidental to it.

Mere Tubercles, at their first formation, are capable of imparting such irritation to the whole lung, as to produce inflammation of its entire bronchial and vesicular structure, and an early and an abiding effusion within it; and this effusion gives occasion to its own auscultatory Signs. But the Tubercles may be so scattered through the lungs, and so little accumulated in any one situation, as of themselves to cause no perceptible obstruction to the passage of air, and consequently to give no auscultatory Signs by which they can be suspected to exist.

In the autumn of the year 1833, a young man (Thomas King) was admitted into this hospital, and remained here three months, until he died. His case is so important pathologically, and so aptly illustrative of those practical points I am now considering, that I must be allowed to dwell upon it a little at large.

He had already been ill three months before his admission. His complaint began with Hæmoptysis, which occurred to the amount of four or five ounces when he was making some unusual exertion, and continued in smaller quantities for a few days, and then ceased altogether.

At his admission he was pale and emaciated; his pulse was 140 in a minute, and of extreme feebleness. He had profuse perspirations at night; he suffered an agonizing dyspnœa, and brought up a scanty glutinous expectoration, with great effort of coughing.

Auscultation discovered at this time a clear respiratory murmur in every part of the left lung, and in the right a clear respiratory murmur, confined to its *very upper* part, and then a widely-diffused small Crepitation, which gradually faded away into absolute dulness as you approached nearer the bottom. It was not long, however, before the condition of the left lung was the same to Auscultation as the right.

I know no distress greater than that which attends the collection of viscid mucus in the lesser bronchi and vesicular structure of the lungs. There is a constant dyspnœa and ceaseless provocation to cough, and an agony, and striving to tear up from the respiratory passages something that will not come. Such distress was unmitigated in this poor fellow for three months together.

This same condition of the lesser bronchi and vesicular structure, when it results from acute inflammation, seldom lasts long; yet even for a few days the agony of the dyspnœa and fatigue of the cough are hardly tolerable. But *here* they were abiding and unaltered for three months, kept up by inflammation (if you please), but inflammation of no action and no power, where the pulse was always of extreme frequency and extreme feebleness.

No remedies that were employed at all assuaged the distress or altered the conditions of the disease within the chest; and the auscultatory Sign to the last, the only Sign, was small Crepitation largely diffused through both lungs, which, at their lower part, were almost dull. He died exhausted.

Now, long before his death, I certainly did suspect that this effusion throughout all the bronchial passages was not kept up solely by the idiopathic disorder of their lining membrane, but that something would be found elsewhere within the lungs capable of producing and maintaining it; and I certainly did conjecture that we should find Tubercles, partly from the whole malady having commenced with Hæmoptysis, and partly from not knowing what else there could be.

Dissection discovered the pleura adherent on both sides, — on the left partially, on the right universally; and the whole membrane apparently converted into a thick cartilaginous substance; the entire lungs loaded with bloody serum, and their whole texture so softened as to break down easily under pressure of the fingers. These were all the results of common inflammation, which had reached to every tissue which composes the structure of the lungs.

But dissection discovered, moreover, myriads of Tubercles, distinct, and sprinkled universally throughout the lungs; grey, and as minute as millet-seeds, in the lower lobes; yellow and of a larger size in the upper.

This is not a common specimen of disease, but it is a very instructive one, and *therefore* I have quoted it. It is remarkable, in contrast with the forms of Pulmonary Consumption which I have before described, that *here* the minutest Tubercles, not one of which had passed on to the state of Vomica, should be capable of producing inflammation, and diffusing it so generally, and maintaining it so constantly; and that these mere Tubercles should continually supply such an amount of irritation that no remedy could in the least degree abate the inflammation (otherwise perhaps curable in itself) which they were always present and ready to renew. In this case the secondary and incidental morbid processes entirely outran those which were primary and specific; and the patient perished of inflammation of the entire lungs, the Phthisical disease having not passed beyond its earliest and tubercular stage.

But, trusting to my own experience, I should say, that it was a rare thing for Pulmonary Consumption thus to kill, by producing *chronic* inflammation and *chronic* effusion into the entire bronchial and vesicular structure of the lungs, itself still remaining in the tubercular Stage, and the Tubercles not yet occasioning any auscultatory impediment to the passage of air. It is more according to my observation that, *in this stage*, or under these conditions, it should produce *acute* inflammation, either proving fatal in a few days, or requiring active treatment to prevent it from becoming so. And it is still more according to my observation, that in this stage, or under these conditions, it should produce Hæmoptysis; which also may be called acute, being accompanied by fever and much vascular action, and liable, too, to prove fatal in a few days, or requiring active treatment to prevent it from becoming so. In the fatal cases the unsuspected Tubercles are only discovered after death.

Yet attacks of acute Inflammation or acute Hæmoptysis from such a cause are not usually fatal: but, the cause still remaining, they are apt to recur again and again; and at length, when the Tubercles increase sufficiently to obstruct the passage of air through certain parts, and to occasion dulness here and there, and a more energetic and compensating respiration elsewhere, then the secret of the former inflammations or hæmorrhages are revealed. At this point the mixed character of the disease begins to declare itself by the mixed character of the auscultatory Signs.

Now, although Pulmonary Consumption (as we have seen) unquestionably can, and sometimes does, produce Inflammation or Hæmorrhage of the respiratory passages, long before it is so far developed as to give any direct tokens of its own existence, yet this is not the usual course: it most frequently happens, that neither Inflammation nor Hæmorrhage are added to it, until Tubercles have at least reached that degree of accumulation when they begin to give occasion to certain auscultatory Signs.

I think I have observed that, as long as the Pulmonary Consumption remains in its tubercular Stage, if an Inflammation or a Hæmorrhage be added to it, they are apt to occur in distinct attacks, occasionally and casually.

I formerly mentioned the frequent cases of Hæmoptysis admitted into this hospital, which were connected with Tubercles of the lungs. The attack is usually sudden; the quantity of blood lost in a short time considerable; the treatment required usually active; and the result, as far as the mere Hæmorrhage is concerned, usually successful. Moreover, the auscultatory Signs denote the mixed nature of the disease. While the spitting of blood continues, and perhaps for a short time after it has ceased, there is a large or small Crepitation commonly arising from a considerable space at the lower part of one or both lungs. This denotes the bronchial or vesicular effusion, as distinguished from the deposition of Tubercles. Then there is a diffused dulness both to Percussion and Auscultation somewhere; perhaps between the clavicle and mamma on one side; and an exaggerated respiratory murmur somewhere else; perhaps between the clavicle and mamma on the other side. These denote the deposition of Tubercles, as distinguished from the bronchial or vesicular effusion.

To my experience bronchial or vesicular Hæmorrhage is more familiar as an accompaniment of Phthisis, than bronchial or vesicular Inflammation; the effusion of blood than the effusion of serum or mucus, while the disease is yet abiding in its tubercular Stage. But when Inflammation *does* occur, I have generally remarked in it the same circumstances and attendant conditions which belong to the Hæmorrhage; the same sudden and distinct mode of attack; and that degree of excitement of the blood-vessels which requires the same treatment; and the same successful result. Moreover, there have been the same auscultatory Signs; namely, crepitation at the lower part of the lungs, produced by the effusion of serum or mucus; and dulness at the upper part, produced by the deposition of tubercles. The only difference is, that in one case serum or mucus is expectorated, and in the other blood.

I here speak of Hæmorrhage and of Inflammation as of two things, not wishing to swerve from the customary language of medical men; but, if I might use my own language, I should speak of *vascular action terminating sometimes in effusion of blood*, and *sometimes of serum or mucus;* as of one thing tending to two results; for whether the result be the effusion of blood, or the effusion of serum or mucus, the vascular action requires the same treatment according to its degree, and is as much inflammatory in one case as the other. Moreover, it is this vascular action which is our only practical concern; we treat it, and *it only*, and have no special care of either blood, serum, or mucus, for which in themselves we can do nothing remedial.

But it is when Pulmonary Consumption has advanced beyond the tubercular Stage that we find the most frequent examples of its mixed character. Bronchial or vesicular effusion is almost the constant accompaniment of Vomicæ; and the expectoration is now often as much supplied by the mucous lining of the air passages as by the Cavities themselves.

You have only to go into the wards of the hospital, and you may at once acquaint yourselves in a dozen instances with the mixed character of the auscultatory Sounds. Gurgling Cough, Gurgling and Cavernous Respiration, Pectoriloquy, one, or several, or all together, will show that this, that, and the other patient, have Vomicæ in their lungs; and Large and Small Crepitation, one or both concurrently, will show also that this, that, and the other patient, have fluid effused here, there, or every where, within the respiratory passages.

Now when Vomicæ have been long formed, and the expectoration long established, Hæmorrhage and Inflammation are less liable to occur in sudden and distinct attacks. The blood, or mucus, or serum, which are now separated from the surface of the air passages, result from a vascular action of less force, but of more permanency, and are themselves more abiding.

It should be remarked, however, that blood, which is more common in another stage of Pulmonary Consumption, is more rare in this; not that blood does not *now* sometimes appear, but it appears rather as a part of the expectorated matter, streaking or staining it, than as pure and sincere blood.

Assuredly, after the expectoration is established, sudden and profuse gushes of blood seldom occur. Probably the expectoration itself is the security against them, the circulation thus obtaining all the relief it stands in need of. Probably, too, the security becomes greater in proportion as the expectoration is more copious and more free, and proceeds from a larger extent of mucous surface.

All this is, in the nature of things, very probable, and it is confirmed to me by the striking fact which, in a few instances, I have known, of a copious muco-purulent expectoration suddenly ceasing, and a frightful Hæmoptysis at once bursting forth; as if the circulation, being suddenly baffled, had sought and found the nearest way to free itself. In these instances, when the Hæmorrhage ceased, the expectoration was re-established.

It should be mentioned, that in the destructive processes connected with the formation of many and large Vomicæ, the blood-vessels of the lungs do not always escape ulceration, or rupture, while they are yet pervious; and then a mortal Hæmorrhage is the consequence. But such Hæmorrhage is purely accidental, and independent of any proper hæmorrhagic action (if I may so call it) in the vessels themselves.

Let me guard you against a vulgar error. Hæmoptysis and rupture of a blood-vessel are, in the popular sense, convertible terms; so much is one conceived to be the natural and necessary consequence of the other. But rupture of a blood-vessel, which has been esteemed the only cause of Hæmoptysis, is unquestionably the rarest cause of all; and this accident, which one might expect to find frequent in Pulmonary Consumption, nature has taken great pains to guard against; for no sooner does the destructive process of forming Vomicæ within the lungs begin, than she sedulously betakes herself to closing up the arteries which lead to them by clots of blood: and as to the veins, partly (I believe) by the same process, and by otherwise arresting the circulation through them, she reduces them to impervious shreds.

Now, in all cases of Pulmonary Consumption arrived at the stage of Vomicæ, I would recommend a constant regard to the extent of the disease beyond its specific limits. I would recommend that, besides attending to the sounds indicative of cavities, you should take especial note of *Crepitations*, and how they vary in the distance to which they spread themselves from time to time. The Gargouillement, and the Pectoriloquy, and the Vomicæ, from which they arise, are beyond our reach *remedially*; not so the Crepitations, and the vascular action which produces them. In my treatment of Pulmonary Consumption, I am accustomed to make these Crepitations serve me for practical indications, endeavouring by all means to lessen and circumscribe them, and thus seeking, under the guidance of Auscultation, to bring back the disease as much as possible within its specific limits.

The bronchial and vesicular effusion, which is the concomitant of Vomicæ, submits itself to the influence of medicine in various degrees. Very often, when there are Gurgling Cough and Gurgling and Cavernous Respiration and Pectoriloquy, at certain points, and, withal, Large and Small Crepitations diffused widely through the lungs, a seasonable remedy will entirely sweep away the latter sounds, and leave the former *alone.* A small cupping, a few leeches, a blister, a liniment, a mustard cataplasm — one or other of these, according to the degree of vascular action, applied at the right time and in the right place, will produce immense relief, by bringing the disease back for a while within its specific limits.

It is thus, as perhaps you may have remarked, that almost every phthisical patient brought into the hospital experiences great relief for a short time after his admission. The poor, alas! are not only the chief victims of Phthisis, but they suffer the disease with all its occasional superadded evils, which their exposure, their hardships, and their needful toils, will not allow them to escape. With them, the superadded evils are often beyond all proportion to the disease itself. The Tubercles and Vomicæ may be few, and the bronchial and vesicular effusion immense; and this superadded effusion may be for the first time submitted to a remedy when they reach the hospital, and then it is often in a great part or altogether swept away. No wonder that, from the relief which follows, the patients should sometimes believe themselves cured at once and entirely!

But the effusion again and again returns, and requires again and again to be abated.

Thus I have given a sketch only of a vast subject, which is interesting, fearfully interesting, to all mankind. I have not crowded it with a multitude of instances, for I had not room for them; and I was afraid they might obscure the outline, which was all I designed to give.

In tracing this outline my own experience has guided me; and yours will soon enable you to fill it up, and to determine how far it is true and how much it is worth.

There are many strange things respecting Pulmonary Consumption — many striking discrepancies between case and case, and many contrarieties of opinion among the well-informed as to its proper mode of treatment, — which, heretofore, the best of us have been unable to reconcile or explain. In one case it is a slow decline; in another a galloping consumption. It is spoken of as incurable; and yet now and then an individual recovers, or seems to recover. Some are for treating it by bleeding. Some by bark and steel, and ammonia. Some restrict their patients to vegetables and asses' milk, and some give them animal food and wine; and all can boast of their success.

But these things have now ceased to be mysterious any longer; thanks to a more enlightened pathology and to that method of diagnosis which not only marks the due course and progress of the specific disease, but does not allow even emergent and contingent events to escape its scrutiny.

This same method, still aided and guided by a just pathology, has enabled us to discern more clearly the avenues through which nature admits relief, and to direct our remedies with a steadier aim; albeit such remedies are of various and even opposite kinds.

Unquestionably, within the limits of *possible* success, Auscultation has contributed to render our treatment of Phthisis more successful.

It has been the means of discovering no new remedy. How should it? It has made nothing curable now, which was incurable before. But, while it has taught us to distinguish the unmixed from the mixed Phthisis, the disease from its accidents, what is reparable from what is not, *in the patient while yet alive*, it has enlarged the resources of practical medicine, by more clearly presenting to it the objects within its reach.

By keeping those objects, thus offered to you, steadily in view, you will be able to fulfil more satisfactorily every purpose that rational treatment can contemplate in a disease which, if it be not incurable, is rarely cured. You will know better how to remove its many superadded evils, to postpone or mitigate its many pains, perhaps to lengthen life, and to procure for it, while it lasts, some share of happiness.

I cannot finish this little sketch of Pulmonary Consumption, and of the uses which Auscultation serves in distinguishing its kinds, and in furnishing guidance for its treatment, without adding one further remark; it is *this:*—In Pulmonary Consumption death not unfrequently arrives at a much earlier period than seems consistent with the morbid processes going on within the chest. Patients die sometimes long before the disease of the lungs has reached the point at which it is necessarily fatal. I do not mean that phthisical patients may chance to suffer fever or cholera, or may chance to break a limb, and so die of other diseases or accidents. These cannot be anticipated or guarded against. But I mean something more worthy of your consideration.

In proportion as we are more intent upon investigating the local processes of diseases in a particular organ, scrutinizing them pathologically, and nicely weighing their diagnostic signs, there is a danger that our minds may be withdrawn from those larger views which regard their constitutional origin, and their consequent liability to fall upon any or all organs of the body. Thus, while we are expecting a man to die of Pulmonary Consumption a twelvemonth hence, he may die in the mean time of (if I may so speak) Intestinal Consumption, Peritoneal Consumption, Mesenteric Consumption, or Vertebral Consumption. For, from the same strumous constitution, which engendered Tubercles and Vomicæ in the lungs, Tubercles and Ulcers are formed in the mucous lining of the bowels; hence comes an incontrollable diarrhœa or dysentery. From the same cause Tubercles are formed upon the peritoneum, and Tubercles in the mesenteric glands; hence come slow peritonitis, and ascites, and marasmus. From the same cause caries affects the bodies of the vertebræ; and hence comes lumbar abscess.

All these are liable to arise in the course of Pulmonary Consumption; and the fatal event may be greatly accelerated in consequence. Not that, from arising in the course of it, they are to be regarded as merely incidental to it; for both it and they are all of the same essence, the several products of the same morbid constitution; sometimes one and sometimes another taking the lead; Pulmonary Consumption as often following these, as these following it.

Finally, then, Pulmonary Consumption is no more than a *fragment* of a great constitutional malady, which it would be in vain to think of measuring by the stethoscope, and which it belongs to a higher discipline than any mere skill in Auscultation rightly to comprehend.

LECTURE XIV.

ON THE DOCTRINE OF SYMPTOMS.

POSSIBLE FALLACIES OF AUSCULTATION. — HOW IT MAY LEAD TO AN ERRONEOUS DIAGNOSIS — IN PNEUMONIA — IN DILATATIONS OF THE BRONCHI — IN EMPHYSEMA OF THE LUNGS. — PATHOLOGY OF DILATATIONS OF THE BRONCHI. — PATHOLOGY OF EMPHYSEMA OF THE LUNGS. — HOW THE INTIMATIONS OF AUSCULTATION AND PERCUSSION MAY APPARENTLY CONTRADICT, YET REALLY CONFIRM, EACH OTHER.

I HAVE endeavoured to speak of the auscultatory Signs that belong to the lungs as plainly as I could. First I took them singly, and tried to fix their separate value by a reference to the simpler forms of disease; and then I took them together, seeking their relative and combined value in forms of disease that are more complex. And thus I found that a single pathological condition might be denoted by a single auscultatory Sign; that in Bronchitis, when it had not passed the stage of mere vascularity, there was nothing but a *dry* Sibilus, and when it had reached the stage of effusion, nothing but a *moist* Crepitation. Moreover, I found that, as diseases were cumulative, so might their auscultatory Signs be cumulative also; and that a mixed case of Pulmonary Consumption often contained every one of the auscultatory Signs that have been mentioned.

These Signs, both singly and cumulatively, I have followed as far, perhaps, as they can be altogether trusted in the diagnosis of pulmonary diseases. Not that, beyond this point, they have no further aid to contribute; only they need more confirmation from concurrent circumstances, and require more care on our part, to avoid certain errors, to which, if too implicitly relied upon, they are apt to conduct.

Auscultation is not infallible. I have known it betray the most wary and experienced into downright error; as when a certain sound, which in forty-nine cases indicates one thing, has in the fiftieth case indicated another. You ought to be aware how this may happen. As also, when the several auscultatory Signs of one and the same case seem to set themselves in opposition to each other, one indicating this thing, and another that; one confuting what another affirms. This apparent contradiction is at first very perplexing; but, being understood, turns out to be no contradiction at all; and the apparent contradiction and the real consistency furnish together a sure diagnosis of a particular form of pulmonary disease. You ought to be aware how this, too, may happen.

In what manner, then, an auscultatory Sign may give false intimations, and how several Signs may seem to contradict, and yet be perfectly consistent with, each other, I will now endeavour to explain. For this purpose I must touch a little upon some points of Pathology.

It has been by thelight of certa in facts in Pathology, considered as general truths, that Auscultation has reached some of its most important conclusions.

Of such facts these two deserve to be especially noticed; viz. that Tubercles and Tubercular Cavities have their origin in the upper lobes, and Inflammation its local origin in the lower lobes, of the lungs.

These two facts are so generally true, that they have been set up as signals (if I may so say) to steer our diagnosis by; and Auscultation has reached some of its safest conclusions entirely from faith in them.

But ordinary diseases will sometimes occur under extraordinary circumstances, or in unusual situations; and then we are as apt to be thrown out in our diagnosis, as the pilot is in his course upon any unexpected alteration of lights or signals on the coast. He makes false points, and so do we.

Thus in every instance of exception to the two general truths which have been specified, there is a perilous chance that Auscultation will lead us wrong.

In forty-nine cases out of fifty, Pectoriloquy is a direct symptom of a cavity formed in the lungs, the result of tubercular Disease, or the result of

Inflammation. Then comes the fiftieth case, in which there is Pectoriloquy, arising not from a cavity either tubercular or inflammatory, but from some other condition; and in this fiftieth case the Pectoriloquy, I suspect, almost always deceives us.

A young woman (Mary Taylor) was admitted into the hospital in September, 1833. For two or three years she had been liable to slight coughs, and in the last spring had suffered Influenza. The Influenza passed away, but a slight cough was still left behind.

Three days before her admission she had a rigor, inability to lie on the right side, and pain shooting from beneath the right clavicle through the chest to the scapula.

At her admission she was flushed and hot, her respiration hurried, her pulse 112 in a minute, and full and soft; and she complained of pain in the situation just mentioned.

Auscultation found a healthy respiratory murmur, unmixed with any unnatural sound, throughout the entire left lung, but in the right lung Cavernous Breathing, and a loud Pectoriloquy above the spine of the scapula, and small Crepitation all around it; also a space beneath the clavicle dull to the ear, and dull to Percussion, while the rest of the lung was healthy. Six leeches were the most active remedy which her strength would admit, and they were applied beneath the clavicle.

She was delirious through the night, and perspired greatly. The next day she was more flushed: her dyspnœa was aggravated; her pulse had gained in frequency, and had lost in power; she was altogether very much sunk. The Pectoriloquy was still clear and evident, and the *small* Crepitation still heard every where about the scapula, and moreover in front, about the mamma.

Our diagnosis in this case was, that one considerable Vomica at least existed in the apex of the right lung, and that *acute* Inflammation of the vesicular structure had arisen all around it.

She was treated by remedies as active as her feeble circulation would admit, chiefly by leeches to the surface opposite the parts where the Crepitation was heard. In four days the Crepitation began to abate, and in six it was gone; and, as it gradually went away, the respiratory murmur gradually returned, until it entirely took its place.

But what became of the Cavernous Respiration and Pectoriloquy? These surely remained unaltered; for the Vomica could not be so soon cured, although the surrounding Inflammation might?

Not so. But the Cavernous Breathing and Pectoriloquy were first changed into Bronchial Respiration and Bronchophony; and these last soon ceased; when nothing was any where heard but the healthy respiratory murmur. The patient was well, and the whole work of reparation was accomplished in a week.

The diagnosis, I have said, was that she had one large Vomica at least at the apex of the right lung, and that acute Inflammation had arisen around it. I apprehended that she would die quickly, so fearfully rapid was her sinking in the first two days after she reached the hospital. But a week from that time she was well, and a fortnight from that time she was discharged from the hospital.

In this case I was entirely deceived in regard to one supposed ingredient of the disease, the Cavity. And I was deceived *by Auscultation*. Cavity there was none, which is the very thing we expect to find at the apex of the lung. But Inflammation there was, and of the acutest kind, and nothing but Inflammation, which is the very thing we *do not* expect to find there.

It is quite certain that the Cavernous Breathing and Pectoriloquy were formed in a bronchial tube passing through a portion of lung which had become partially condensed by Inflammation. As the lung began to admit more air, the Cavernous Breathing and Pectoriloquy lost their distinctness, and were changed into Bronchial Respiration and Bronchophony; and when the lung became entirely free, the healthy murmur was re-established alone and unmixed with any unnatural sound whatever.*

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* Inflammation, independent of tubercular disease, is so rare an event in the upper lobe of the lungs, that my own

Let it, however, in justice be remarked, that although Auscultation misled me both in my diagnosis and prognosis, yet it betrayed me into no error of treatment. Nay, but for Auscultation, I might have treated the case less precisely and less effectively. It pointed out to me the very part where the disease was, and told me that Inflammation was at least an ingredient of it; things which could only have been conjectured without the aid of Auscultation.

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experience does not enable me to speak confidently of its auscultatory Signs. What I have noted as a peculiarity, may be the natural and necessary result of Inflammation in a part where the Bronchi are large and near the surface, and the lung partially or altogether condensed around them. I am not prepared to say that the same pathological conditions, which in other parts of the lungs would produce Bronchial Respiration and Bronchophony, may not *always* produce Cavernous Respiration and Pectoriloquy in the upper lobes. The following case lately fell under my observation: — A girl twelve years of age had a hot skin, a flushed countenance, a rapid pulse, difficult breathing, and small Crepitation widely diffused throughout the left lung. Every part of the lung was still pervious, but less air was manifestly admitted into the upper lobe than elsewhere. Moreover, at two or three spots about the scapula, Cavernous Respiration and Pectoriloquy were distinctly heard. No clear account could be obtained of the girl's illness before her admission into the hospital. But from present symptoms I had no doubt that the left lung was extensively inflamed, and that it contained several Vomicæ.

Nothing remained but to subdue the inflammation; and, indeed, the remedies succeeded beyond our hopes; for in curing the inflammation they (apparently) cured the Vomicæ also. In the course of ten days the healthy respiratory murmur had taken place of the Crepitation, and the Cavernous Breathing and Pectoriloquy were no longer to be heard. — February, 1836.

There are certain conditions of the lungs now familiarly understood (or at least familiarly spoken of, as if they were understood) by medical men, which had been little investigated, and were little known, before Auscultation directed attention to them; and yet, both pathologically and practically, they are of the highest import. Laennec seems to have been first led to make accurate inquiry into the nature of Dilatations of the Bronchi, and Dilatations of the Vesicular Structure of the Lungs, for the sake of verifying certain auscultatory Signs. And all who concern themselves with Auscultation, and seek in like manner to verify its Signs by dissection, will soon feel their obligation to him for his elucidation of these subjects.

Dilatation of the Bronchi may take place in one or in several, in any or in almost all their branches, throughout the lung; it is, however, most frequently met with in the upper lobe, and nearer its anterior surface.

A Bronchus may dilate, and still preserve its natural cylindrical form. That, which would not naturally receive more than a knitting-needle, becomes large enough to admit a crow-quill, or a goose-quill, or even a little finger. It seldom happens that the common bronchial trunk is sensibly dilated, but the branches become larger than the trunk from which they are given off.

But a Bronchus may dilate and not preserve its natural form. It may dilate so as to take the form of a Cavity, having the same size and shape as a Vomica; it is distinguished, however, from a Vomica, by the structure of the Bronchus being traceable into it; its mucous membrane, its fibrous membrane, and sometimes vestiges of its cartilaginous rings.

Again, a Bronchus may so dilate as to form several Cavities; that is, it may dilate and then contract itself again to its ordinary calibre, and dilate and contract again and again at several spaces in its course. Thus, upon dissection, the lungs have sometimes appeared to be beset with Vomicæ or abscesses full of matter, which, upon examination, have turned out to be so many Cavities formed from the dilatation of several bronchial ramifications.

When the Bronchi are numerously and extensively dilated, they so compress the intermediate pulmonary structure as to preclude the admission of air into its vesicles; and thus it becomes squeezed together and flaccid, exactly resembling lung which has suffered from pleuritic effusions.

There seems good reason to believe that the Bronchi become dilated by the long-continued residence and accumulation of morbid secretion within them; and that the bronchial trunks are less frequently dilated than their branches, because this morbid secretion is accustomed to linger within them for a shorter time, being more easily dislodged by forced expiration, *i. e.* by Cough.

I know no instance of dilatation of the Bronchi where it has not followed or accompanied some disease especially characterized by abundant secretion; such as protracted Hooping-cough, chronic Bronchitis, or Catarrh.

Surely this little pathological sketch will at once show what the auscultatory Sounds must necessarily be which accompany dilated Bronchi. If they be enlarged uniformly through their whole course, they must give rise to Bronchial Respiration and Bronchophony, and much more so, if they pass through compressed lung. If they be formed into Cavities, they must occasion Cavernous Breathing and Pectoriloquy; and when those Cavities contain fluid (as they generally do) they must produce Gurgling Respiration and Gurgling Cough.

But Bronchial Respiration and Bronchophony, Cavernous Respiration and Pectoriloquy, Gurgling Respiration and Gurgling Cough, have been dwelt upon and explained as the almost certain signs of condensed lung and pulmonary abscesses; of lung, condensed by the products of common inflammation or of specific disease; of abscesses formed by inflammation, or left after the evacuation of tubercular matter. And of such conditions they must still continue to be the *almost certain* signs. It is only when they are interpreted by the special circumstances of some particular case, that they can be construed into a different meaning, or serve to indicate Dilatation of the Bronchi.

But the circumstances are *seldom special enough* to turn aside the auscultatory Signs from their most common object, and to make them point to another which is of very rare occurrence. Hence I am persuaded that the most experienced and most skilful physicians generally fail to form a just diagnosis in cases of Dilatation of the Bronchi, and seldom fail to form a wrong one; the auscultatory Signs and every attendant circumstance conspiring to lead them into error.

Chronic Bronchitis is the most frequent cause and concomitant of Bronchial Dilatation.

Now chronic Bronchitis itself is often with great difficulty distinguished from Pulmonary Consumption. Its attendant emaciation, its copious puriform sputa, its abiding hectic, are all phthisical symptoms. And it is only after repeated examinations that we are able to exclude the idea of Phthisis when we find no auscultatory Signs of a cavity. There is large Crepitation extensively diffused through the whole lungs, and that only; showing that the copious puriform sputa come from the mucous lining of the Bronchi, and from it only.

But, suppose that in such a case there was Pectoriloquy withal and Pectoriloquy in several places, or Gurgling Respiration and Gurgling Cough in several places, no human penetration could distinguish the disease from Pulmonary Consumption; and yet there might be neither Tubercle nor Vomica in any part of the lungs, but a dilatation of the Bronchi into the form of Cavities.

A man, 46 years of age, had been liable to Catarrhs for several years, and for one year had suffered a slight habitual oppression of the chest. He had once spit blood in December of the preceding year. In the following February, upon the occasion of his contracting a fresh cold, an expectoration came on, which was copious and puriform, and very fœtid. Finally, a week before his admission into the hospital, he suffered a severe pain in the left side of the chest, which came on for the first time after his being wet through, and ever afterwards he was constrained to keep his bed.

He entered the hospital at the end of March. He was in a state of orthopnœa, and his countenance expressed the greatest anxiety. He rejected, by an easy cough, a fœtid expectoration, consisting of yellow thick globules, mixed with a large quantity of serum, upon which they floated. The pain was so great over the whole of the *left* side of the chest, as not to allow the use of Percussion.

Auscultation found the respiratory murmur every where strong and clear on the right side; and much more feeble every where on the left; and on the left side, in the region of the mamma, and a little above the inferior angle of the scapula, there was manifest Pectoriloquy.

Nobody entertained the slightest doubt in this case that the disease was Pulmonary Consumption, and that a Vomica was formed. The patient remained in the hospital until his death, — nearly three months. In the mean time the pain of the left side, the fetid expectoration, and the Pectoriloquy, all remained, to which, at length, Diarrhœa was added. It was remarkable that every evening he suffered a chilliness, followed by burning heat, but without perspiration.

Upon dissection, the left lung hardly crepitated at all, although it floated in water. In its upper lobe was a cavity large enough to admit a middle-sized nut, which contained a fluid of the same kind with that which had been expectorated. A bronchial tube, as large as a goose-quill, entered into it; and dissection traced a continuation between the walls of the bronchus and the walls of the cavity: in both the same mucous membrane, red and thickened, the same fibrous membrane, and some traces of cartilaginous rings.

Here was no Vomica, but a partial dilatation of a bronchial tube. In the same lung several other bronchial ramifications were dilated in the same way; suddenly they acquired three or four times their natural size, then contracted themselves again, and then enlarged again; thus in effect forming cavities. The pulmonary tissue between the dilated bronchi was compressed as by pleuritic effusion.*

This case did not occur at St. Bartholomew's, but at La Charité. I was not the person deceived, but Andral: the possibility of deception, therefore, you will the more easily conceive. I have abridged the case from the "Clinique Médicale."

I am very far from saying that a just diagnosis of bronchial Dilatation cannot be made during the life of the patient, or that Auscultation cannot contribute essential aid towards it; only I am persuaded that the physician must have very favourable opportunities of watching his patient, and that the case must be less complicated than such cases usually are, before he can arrive at it. The case, too, must be one in which the bronchi are enlarged, still preserving their natural form, and not dilated into cavities.

But Laennec was led also by Auscultation to make inquiry into the nature of Dilatation of the pulmonary vesicles; and this subject, as well as that of bronchial Dilatation, he has made his own by the accuracy of his research.

The surface of the lung will sometimes present to the naked eye the same appearance which is given to it by an ordinary magnifying glass. The pulmonary vesicles will appear of the size of millet-seeds, or hemp-seeds, or raisin-stones; and thus dilated, they sometimes preserve the level of the lungs, and sometimes transgress it a little.

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* Andral, Clinique Médicale; Mal. de Poitrine, vol. i. p. 24.

This appearance results in part from the Dilatation of single vesicles, and in part from the union of several, produced by the rupture of their intermediate partitions.

Sometimes a transparent vesicle, as large as a nut-kernel, will rise very much above the surface of the lung, and seem to spring from a pedicle, or stalk. But this appearance is merely owing to its simple constriction just at the point of its emerging above the level of the surface.

Where the air-cells appear thus dilated at the surface of the lungs, the same condition is found to exist within. In order to see this condition in the lungs to the best advantage, you should inflate them, and then let them dry. Afterwards, when you have divided them with a sharp knife, you will find, by examining the cut surface, that the air-cells are almost always more dilated within than they appear to be on the surface; and you will see, moreover, that of the air-cells some are simply dilated, and some are ruptured and united together. The smaller bronchi sometimes partake of the Dilatation of the air-cells to which they lead: but this event, which one would think likely to happen constantly, does in fact happen very seldom.

In a lung, of which the air-cells are dilated, there is something very peculiar to the touch. It has the feel of a downy cushion, not the crepitant feel of healthy lung. It is softer than healthy lung, and the same degree of pressure evidently displaces in it a larger quantity of air at once.

Now all this description belongs to conditions in which the air still remains within its proper vessels, those vessels being permanently and unnaturally distended; or distended and, moreover, ruptured into each other.

Hitherto I have abstained from using any name but what was necessary to the description. I have used none but *Dilatation of the air-cells or vesicles.* But this same Dilatation of the air-cells, in which the air *is still contained within its proper vessels*, is called by every body Emphysema. And Emphysema let it be called; only take care that the misnomer does not convey an erroneous idea. I have no fancy for disputing about names; but this I would remark, that you might just as well call an Aneurism a Hæmorrhage, as a simple Dilatation of the air-cells, or the Rupture of the air-cells into each other, an Emphysema.

If an Aneurism bursts, then follows a Hæmorrhage; and if air-cells burst, otherwise than into each other, then follows an Emphysema. And, in fact, distended air-cells often do burst, not into each other, but so as to allow the air to escape into surrounding texture.

One form of this Emphysema proper (as it may be called) is, when an air-cell bursts near the surface of the lungs, and air is effused beneath the pleura pulmonalis. Thus a vesicle may be formed of any size, from the egg of a sparrow to the egg of an ostrich, or even larger still. The air, now extravasated beneath the pleura, is capable of being displaced by pressure.

Another form of Emphysema proper is described by Laennec, which I never saw. It is occasioned by rupture of distended air-cells; not on the surface, whence air escapes beneath the pleura, but in the interior of the lung, whence air escapes into the pulmonary tissue and lacerates it, and forms a cavity in it. The cavity thus formed is capable of receiving a moderate-sized nut. It is generally found about an inch deep beneath the surface of the lung. It is permanently blown up with air, and sometimes contains blood. The air-cells, which immediately form the walls of the cavity, are effaced, and do not retain their natural rounded form, either to the eye or the magnifier. But the air-cells at a little distance all around are still distended with air. The air, under these circumstances, is not necessarily effused into the interlobular structure; although it has escaped from its own vessels, it is still limited to this cavity.

There is one very curious circumstance attending this form of Emphysema. It is this: the pulmonary cavity, which is about an inch from the surface, being permanently blown up with air, exercises a great stress upon surrounding parts.

Under this stress they yield the most readily in that direction where there is the least resistance — viz. in the direction of the surface; and *there* a bump is forced up, correspondent in size to the interior cavity, and just over the part where it is situated.

The Dilatation of the air-cells has been explained to depend upon the forcible incarceration of air within them; and a cause capable of producing that incarceration has been found in inflammation of the smaller bronchial ramifications which conduct to them.

There is an affection called by the French "*catarrhe sec.*" It is characterized by habitual cough, or cough going and coming for years, and accompanied by little or no expectoration. But what expectoration there is consists of small pieces of hard, tough, pearly phlegm.

Upon this chronic affection attacks of a more acute kind are liable to be engrafted from time to time, accompanied by fever, and producing an increase of the expectoration; and, when they subside, often leaving the habitual disorder worse.

In short, it is one form of (what is called) Asthma; and the essential morbid conditions in which it consists are a congestion and thickening of the mucous lining in the small ramifications of the bronchi, and a secretion by it of this little glutinous pearly phlegm.

Now the congestion and thickening of the mucous membrane in that situation, and the residence of tough phlegm upon it, may be obstacles sufficient to prevent the easy return of air *from* the vesicles, while they may *not* be sufficient to prevent the access of air *to* them. The force of inspiration is evidently far greater than the force of expiration; and the former is capable, moreover, of being augmented by an effort of the will, in a much greater degree than the latter.

It is not difficult to conceive how, more air being thus forced into the air-cells by each inspiration than each expiration can expel from them, there would result a constant imprisonment of air within them, and their consequent dilatation and their possible rupture.

I am, however, surprised that such congestion and thickening, and morbid secretion of the mucous membrane in this particular situation, should be insisted upon by Laennec as almost the sole cause of dilatation of the air-cells; for I suspect that all the ordinary mechanical impediments to breathing, whether within or without the lungs, have the common effect of raising hinderances and obstacles, *especially to the act of expiration*, and thus become capable of dilating the vesicles. It has occurred to me to witness their dilatation to the greatest extent, and their rupture and the extravasation of air beneath the pleura to the greatest degree, in cases of excessive deformity of the chest, arising from curved spine. I have found the same, of less degree and extent, in combination with Tubercles and Vomicæ; and I have found dilated vesicles, or ruptured vesicles, in clusters, at the edges of the lungs, where there has been no concomitant disease of the lungs to account for them.

And now for the auscultatory symptoms of Dilatation of the air-cells, or of their Dilatation and Rupture together, as far as they have hitherto been described. These symptoms are of a very remarkable kind: they are derived both from Percussion and from Auscultation, but from neither singly. The positive intimations of the one are now in direct opposition to those of the other; yet do they point to the same thing, and illustrate it *especially by their contrast.* Percussion gives a sound which is loud and clear; while, to the ear, or the stethoscope applied to the same parts, either all is dull, and there is no respiratory murmur at all, or there is one rather suspected than distinctly audible. The chest does not give the same answer when you knock as when you listen.

Now it is not the clear sound upon Percussion that indicates Dilatation of the air-cells, or Emphysema; neither is it the little sound, or the no sound, to the ear and the stethoscope, that indicates it. Either of them taken alone would denote something else; but taken *simultaneously*, they denote Dilatation of the air-cells, or Emphysema.

There is nothing more interesting in the whole subject of Auscultation, than the various ways in which Percussion and Auscultation aid each other. They aid each other by their correspondent results, and they aid each other by their contrasted results; and each is thus made to go as far again by the help of the other, as it could possibly go alone.

Hitherto, in the course of our inquiry, I have spoken of Percussion occasionally only, introducing it to confirm the signs derived from Auscultation by its correspondent intimations. In inflammatory and tubercular diseases of the lungs, what Auscultation found pervious, Percussion found resonant; what Auscultation found condensed, Percussion found dull. But now I introduce Percussion, not to confirm, by *its correspondent* intimations, the signs derived from Auscultation, but to rectify, by *its contradictory* evidences, what, if taken upon the sole attestation of Auscultation, would be false.

It is necessary for the sake of obtaining the full use of both these methods of appealing to the same sense in diseases of the chest, to understand them in their *disagreements;* to know *why* what one finds resonant, the other should find dull.

Percussion, by the resonance or non-resonance that attends it, *simply* intimates that air is or is not contained within the chest beneath the part struck. It intimates so much, and no more, with certainty. It gives no notice respecting the condition in which the air exists, or respecting the exact situations which it does or does not occupy. Whether it be moving about or at rest, there is the same resonance upon Percussion; whether it be contained in the bronchi, or in the air-cells, or in the cavity of the pleura, there is still the same resonance; or so nearly the same, that no one would venture upon a diagnosis of its situation *merely* from a difference of sound elicited by striking the chest.

But Auscultation gives no intimations *absolutely* concerning the existence or non-existence of air within the chest. The air must be there under certain conditions for Auscultation to be able to detect it at all. For Auscultation to detect it, the air must be in *motion.* If it be at rest, Percussion can detect it, but Auscultation cannot. It must also be within the respiratory passages, or in situations with which they freely communicate; if it be beyond them, Percussion can detect it, but Auscultation cannot.

It is from air in these situations and under these conditions; from air in the respiratory passages, and from air put in motion by the act of breathing, that Auscultation conveys to us all the sounds diagnostic of so many varieties of pulmonary disease. For, though air be still in the respiratory passages, if it be imprisoned there, and no motion reach it from the act of breathing, as in the case of dilated air-cells,—or if it escape from the respiratory passages, as in the case of ruptured air-cells and emphysema, beneath the pleura,—then Auscultation can convey to the ear no sound, and is useless for the purposes of diagnosis.

But in this case Percussion still produces a resonance, and tells us (what is the fact) that there *is* air; yet Percussion does not tell under what circumstances or in what exact situation it is.

By comparison, however, and contrast of the results drawn from both methods, we arrive at conclusions in this case, to which neither could carry us separately. The chest is *resonant* to Percussion in every part, a sure evidence that in every part there is air! — but at the same time the chest is in *several* parts dull to Auscultation. Yet here is no contradiction to the fact that air is still in these parts: but, upon comparison, it is a sure diagnostic sign that, being there, it is beyond the reach of the respiration to give it motion; in short, that it is either imprisoned within the air-cells, or extravasated beyond them; and that we have to deal with a case of Dilatation of the air-cells, or a case of Emphysema, or a case of Pneumothorax, of which last I shall speak hereafter.

These, then, being the auscultatory Signs of dilated air-cells and ruptured air-cells, and of air extravasated out of its proper vessels, or (in one word) these being the signs of Emphysema, it would seem to be of easy detection. And, existing *alone*, and unmixed with other morbid conditions, it unquestionably is so; but, in point of fact, it seldom does exist alone.

There are certain conditions of parts frequently met with, which can hardly with propriety be called morbid. Although they are departures from what is natural and healthy, they exhibit no progressive morbid action. The blood-vessels are laying nothing down, and the absorbents are taking nothing up. There is only a yielding of parts to accommodate themselves to some pressing necessity, and a consequent change of natural capacity and size. The common biliary duct, from the passage of a gall-stone, the ureter from the passage of a renal calculus, dilates, at the time, and remains dilated ever afterwards. So too the bowel, above the seat of a stricture, by gradually giving way to the pressure of its contents, will become permanently enlarged, and take the form of a pouch. These several states are all incidental to diseases, but are not diseases themselves.

The like conditions are exemplified, in the lungs, by dilatation of the bronchi, and dilatation and rupture of the air-cells, which grow out of preceding diseases, but hardly bear the character of diseases themselves.

But, although Emphysema may not itself come up to one's notion of what is understood by real disease, yet do real diseases constantly compass it round on every side. Diseases conduct to it, and diseases arise from it; and those that go before, and those that follow after, all remain and exist concurrently with it: so that I do not know any instances of more complicated thoracic affections than those of which Emphysema may, and generally does, form a part. There may be distortion or disease of the dorsal vertebræ; chronic bronchial inflammation; tubercular depositions, or vomicæ; any or all of these together, may have been concerned in imprisoning air within the vesicles, and so causing their dilatation or rupture; and having caused it, they still remain to augment it. Then there is the Emphysema itself; and, superadded to these, and arising out of one or all of them, may be dilatation of the right cavities of the heart.

Imagine what must be the complexity of symptoms from such complexity of disease! To omit others, think what the auscultatory Signs must be! For the tubercular cavities, the bronchial inflammation, the dilated heart, and the Emphysema itself, each have their own. And I do not say that you cannot, from among all the rest, pick out the auscultatory Signs which denote the existence of Emphysema: but when you can, it is a great triumph of diagnosis.

There is (what is called) Interlobular Emphysema, in contradistinction to Pulmonary Emphysema, whose forms we have been considering.

Interlobular Emphysema is an extravasation of air into the cellular substance which intersects and separates the pulmonary lobules. This substance in its natural state is of so close a texture, that the infiltration of air into it could not have been thought possible. Yet the fact is certain. And then its real *cellular* texture becomes expanded and displayed. Thus lobule becomes separate from lobule, a space of half an inch or an inch being sometimes left between them, which is occupied by air that fills the intervening cellular tissue.

This tissue is more abundant and more cellular, and contains more air, as it is nearer the surface of the lung, and goes on diminishing and containing less air as it penetrates deeper. Thus it is a good deal like the natural segment of an orange, which contains more juice just beneath the rind, and less as it approaches the centre.

From the manner in which the interlobular partitions run parallel to each other, it must be obvious that, when several are infiltrated with air at once, there will result a separation of various pulmonary lobules entirely from each other, like little islets.

When this interlobular Emphysema is near the root of the lungs, it soon reaches the mediastinum, whence air escapes into the cellular texture of the whole body.

Interlobular Emphysema, unlike the other forms described, has nothing to do with dilated air-cells: no dilated air-cells are found accompanying it, and where their rupture has taken place cannot be traced. The pulmonary lobules, which are (as it were) blown apart from each other, and have air infiltrated all around them, are themselves in a healthy state.

The Emphysema from Dilatation or Rupture of the air-cells is a chronic affection resulting from causes which are tardy in their operation; but the Interlobular Emphysema takes place in a moment, and is the result of accident. Any violent effort which holds or intercepts the breath may cause it; the striving of parturition, the straining to unload the bowels, or to lift a heavy weight. I have myself seen it produced by the convulsive struggle of hooping cough; at least I presume so: for I have seen the subcutaneous cellular tissue about the neck of a child become blown up with air after a fit of coughing; but this happened before I had Auscultation to help me in inquiring into the conditions of the lungs.

The auscultatory Signs of this Interlobular Emphysema are said to be such as cannot be mistaken, and strictly pathognomonic. They may be so, but I never had an opportunity of verifying them.

All this air effused must insure a clear resonance upon Percussion. Then there are, besides, the "Frottement Ascendant" on inspiration, and the "Frottement Descendant" on expiration; and the "Large dry Crepitation." I wish I could determine the degree of certainty which belongs to these auscultatory Signs: but I cannot, having had no opportunity of investigating the circumstances of such rare cases.

LECTURE XV.

ON THE DOCTRINE OF SYMPTOMS.

AUSCULTATORY SIGNS OF LESS FREQUENT OCCURRENCE.—HOW FAR WORTHY OF REGARD.—METALLIC SOUNDS.—WHERE AND HOW PRODUCED.

After you have been long familiar with Auscultation, and have learned to appropriate its most important signs to the pathological conditions out of which they arise, it will still from time to time be presenting you with things that are new. Various sounds will reach your ear through the walls of the chest in breathing, talking, or coughing, which perhaps you never heard before.

Those unusual sounds, you will find, seldom occur alone, but are commonly superadded to others better understood, by which the essential character of the disease has been already ascertained.

How often, in the wards of the hospital, may you examine the chests of several patients, and find the same auscultatory Signs telling you that they have one and all the same disease; and not only so, but the same disease in the very same stage of its progress! The auscultatory Signs may be Cavernous Breathing, Gurgling Cough, and Pectoriloquy; the disease Consumption, and the stage that it has reached the stage of Vomicæ.

But these auscultatory Signs, which, as to their leading characteristics, are the same in the several individuals, and bespeak the same disease, may include little minor differences. And, doubtless, these too are not without their causes. The various forms and sizes of pulmonary cavities, the firmness or flaccidity of their walls, the smoothness or roughness of their surface, the many or the few, the large or the small bronchi that enter them, while they leave the auscultatory Signs unaltered in their essential characteristics, serve to peculiarise them (if I may so speak) in individual cases.

I have not names for all the strange sounds which I hear every day proceeding from pulmonary cavities. And perhaps it is well that I have not. Auscultation is a new thing; and therefore we are rather disposed to make too much of trifles connected with it; a fault which it is worth your while to guard against. If, by Auscultation, you already know the precise nature of the disease and its exact seat, the stage which it has reached, and the very processes which are now going on within the living body, — if you know the essentials of the case pathologically and practically, — it is a poor and profitless task to be guessing and speculating about mere matters of accident and uncertainty. It is the same thing as if a man, after he had read a book fairly through and mastered it, should think himself bound to count how many lines there were in each page, and how many words in each line.

Nevertheless, you are not at liberty to pass by all auscultatory Signs, except those which are the most constant, and which denote the most frequent forms of pulmonary disease. These, indeed, must always be practically the most important. Yet there are others less common but sufficiently definite, not belonging to the essential character of the disease, but to its accidental varieties, or to ulterior morbid changes derived from it, which require to be well understood. Some of these varieties and changes are of great account in our calculation of the result, and the signs which indicate them acquire a proportionate importance.

It is so especially with those auscultatory Signs which are called metallic sounds. These sounds accompany the acts of breathing, of speaking, and of coughing; of one or the other severally in different cases; or sometimes of one and sometimes the other, or sometimes of all equally in the same case.

These sounds have some variety, but they are all well expressed in general by the term "metallic;" for they are all either *ringing* or *tinkling* sounds, and like such as metal is concerned in producing. Often, too, they have in them something of the nature of an echo, and last for an instant, after the voice, the cough, or the breath that caused them has ceased.

Perhaps the best way of conveying the notion of what they are, would be by stating what they have been thought to resemble. The voice of a person speaking into a well is, in kind, sometimes exactly like the metallic ringing that accompanies the voice and issues from the chest; and the sound produced by blowing sideways into the mouth of an empty bottle, is sometimes like that which is heard in breathing. Take an empty vessel of thin metal, or glass, or earthenware, and strike it lightly with your finger nail, or let a little dry sand fall into it, and you will produce the fainter sort of metallic tinkling. But the metallic tinkling is sometimes louder than the sounds thus produced. The small bells, which are borne by mules and pack-horses abroad, give a sound from a distance exactly resembling the metallic tinkling as I have heard it.

Now the metallic sounds may proceed either from a mere cavity within the lungs, or from some complex disease formed between the lungs and the pleura.

When the metallic sounds proceed from a mere pulmonary cavity, one condition always found to belong to that cavity is, that it is unusually large; and another, that it contains a small quantity of fluid in proportion to its size. And these two conditions are as clearly ascertainable by Auscultation during the life of the patient, as by dissection after his death.

Further, dissection discovers this large cavity always near the surface of the lungs, and adherent to the ribs so closely and with so little intervening substance, that they have seemed to form its external boundary.

I have myself had only one opportunity of examining after death a cavity of the lungs from which this metallic sound has proceeded during life; and this I owe to the kindness of a friend. At the Middlesex Hospital Dr. Watson met with a consumptive patient, in whom the metallic sound, which amounted to a ringing, was strongly marked, and was manifestly formed within a pulmonary cavity. Upon the patient's death he had a preparation made of the parts involved in the disease, and has deposited it in the Museum of King's College. This preparation he has permitted me to examine. It displays a cavity in the upper part of the left lung, large enough (I conceive) to hold more than a pint of fluid. It is of an irregular shape. Internally it exhibits elevations and depressions, and pits and sinuses. Yet the surface, as it at present appears, is so smooth that it might be lined by a continuous membrane. At one part a firm rounded cord, which has the appearance of a blood vessel, runs across it; and low down a single bronchial branch, of about the third division, is seen entering it. Externally it adheres by at least two thirds of its circumference to the ribs; and in all this space not the least remnant of pulmonary structure intervenes. The medium of adhesion interposed between the cavity and the ribs is mere membrane, which the cut edges show to consist of several layers, each about as thick as ordinary writing paper.

Two cases have occurred within my own knowledge, in which the metallic sound proceeded from a mere pulmonary cavity. In them it was present both in breathing, talking, and coughing. It did not accompany the *ordinary* respiration, but a little more energetic breathing would always produce it.

With the metallic sound, and in the same situation there were always present some, but not all, of the common auscultatory Signs which denote a pulmonary cavity. Those, however, which *were* present, were so strikingly exaggerated, that any one listening at the chest for the first time could not help being convinced that there was a large hollow space beneath his ear.

In whatever way air was impelled into the cavity a dry hollow sound resulted. The breathing was cavernous; the voice cavernous; and the cough cavernous. But there was no Pectoriloquy; and no Gurgling in ordinary breathing, and none in ordinary coughing. But Gurgling was still capable of being produced by a hard and forcible cough.

In these two cases the metallic sound was heard over one large space on the right side the chest, circumscribed by the sternum and axilla laterally, and by the clavicle and the mamma above and below, while from every part of the same lung, except this space, the clearest respiratory murmur proceeded. In one of the cases there was a cavity in the corresponding part of the left lung, but occupying a more limited space. This gave out no metallic sound; but it furnished all those auscultatory Signs, which were defective in the other cavity from whence the metallic sound proceeded.

Here, upon a comparison of the auscultatory Signs derived from both lungs, thus much at least may be learnt, that there are conditions belonging to pulmonary cavities which naturally produce one sound and naturally prohibit another; or, conversely, which prohibit one and produce another. The largeness of the cavity in the right lung, and the scanty fluid within it, gave occasion to the metallic sound, and at the same time prevented the Pectoriloquy and the Gurgling respiration from taking place; while the smallness of the cavity in the left lung, and the abundant fluid that it contained, forbade the metallic sound, and caused at one time Pectoriloquy, and at another Gurgling Respiration.

The metallic sound, arising from a mere pulmonary cavity, is a curious phenomenon. It would be interesting to know a little more than we do of its clinical history; especially, whether it belongs to any particular form of Phthisis to produce that sort of cavity which gives occasion to it.

If I could trust my own observation and that of others for proof of a general fact, of which the particular instances are few in my own and not many in any man's experience, I should say, that the pulmonary cavities, from which the metallic sound arises, chiefly belong to *unmixed* Phthisis.

It is where the disease has been of long duration, and where it has gone on enlarging itself within its own specific limits, and has imparted little or no irritation to the surrounding lung, that tubercle runs into tubercle, and vomica into vomica, and one large cavity is ultimately formed out of many.* This is the sort of cavity which gives occasion to the metallic sound. But Phthisis must meet with all the circumstances most favourable to its progress as a purely specific disease, in order that it may be able to form such a one. Above all, it must occur in lungs not over disposed to inflammation. Lungs naturally apt to inflame are impatient of the specific disease that is carrying on its own processes within them. They interfere with its progress from first to last, and do not allow it to reach the greatest increase of which it is capable in any stage, and least of all, in that which is the fullest of irritation to surrounding structures — the stage of vomica.

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* Vide p. 249.

In the two cases to which I have alluded, within my own experience, the Phthisis had been suspected for years, and had existed unequivocally for many months. In both I noted the gradual progress and enlargement of the vomica, before the metallic sound arose, and afterwards. And both before and afterwards there was a clear respiratory murmur in every other part of the same lung.

But it has been said that the metallic sound may result from a complex disease formed between the lungs and the pleura. Here also a cavity is equally concerned in producing it. But the cavity is not in the lungs, but in the pleura; or rather the pleura itself constitutes the cavity. Here, too, the cavity contains fluid, and it contains air. The fluid is supplied by the surface of the pleura itself, but the air is supplied by the lungs.

Now these pathological conditions arise after the following manner. Disease, first existing in the lungs, causes an ulceration or rupture of the pleura, and thus makes an aperture of communication between the bronchi and the pleural cavity. And this aperture once made continues ever afterwards, being kept open by the air that passes through it in the act of respiration. The fluid in the pleuritic cavity is either the mere serous effusion of hydrothorax, or the pus or puriform secretion of inflammation.

Such are the conditions of this complex disease, and such the manner in which they come to pass. But how is the metallic sound produced by them? In every act of breathing, talking, and coughing, the air which is forced through the aperture into the cavity of the pleura, puts in motion the air and the fluid already found there. Hence, a vibration results which is followed by the metallic sound.

But what is the element of the whole disease? Of what nature is the primary morbid process within the lungs which serves as the point of departure (so to speak) for the series of morbid processes that follow? Surely it may be any disease or morbid process that is capable of effecting a solution of continuity in the pleura investing the lungs; whether by ulceration, slough, or rupture. But, in point of fact, Phthisis Pulmonalis is found to do this more frequently than any other. A Vomica, being formed and already communicating with the bronchi on the one hand, reaches, penetrates, and communicates with the cavity of the pleura on the other. In all cases within my own experience Phthisis has thus become the element of the whole disease, except one. And there a gangrenous portion of lung opened the way of communication between the bronchi and the cavity of the pleura, and produced all the conditions necessary to the auscultatory Sign in question.

This, I believe, is a just explanation of the metallic sound when it is produced by (what is called) Pneumothorax; or that complex disease between the lungs and the pleura, of which the most striking result is a collection of air within the thoracic cavity.

For the sake of this explanation I have thus far represented the metallic sound as if it were a single auscultatory Sign standing alone, that so you might *understand* it the better. But you can only recognise it and see its importance and feel an interest about it, by having it represented to you with all its attendant circumstances, and especially with the other auscultatory Signs concurrent with it; these contributing to determine its value and it to determine theirs.

A patient may have all the general symptoms of Pulmonary Consumption, such as emaciation, hectic fever, and cough. A few days ago you may have examined his chest carefully, and found on one side (the right perhaps) gurgling respiration and gurgling cough, and cavernous breathing, and at times pectoriloquy, all in one circumscribed space beneath the clavicle; and, around this space and over the upper half of the right side, considerable dulness both when you knock and when you listen; but over the lower half a satisfactory resonance to percussion and a clear respiratory murmur. On the left side you may have found no unnatural sound whatever, but the respiratory murmur every where exaggerated, and the resonance to percussion every where louder even than at the lower part of the right side, where it was quite loud enough for health.

Here the diagnosis is plain enough. The upper part of the right lung is full of tubercles; and in the midst of them is one Vomica at least: while the lower part is either free from tubercles altogether, or contains so few that they furnish little or no impediment to the passage of air. The left lung, which is striving by a more energetic respiration to compensate for the obstruction of the right, may contain a few scattered tubercles, or none at all.

Such is the diagnosis at which you arrived a few days ago; and such the obvious auscultatory Signs that led you to it. But *now* the gurglings, the cavernous sounds, and the pectoriloquy have ceased; the upper half of the right side, before, behind, and in the axilla, which was so dull, has become clear to *percussion*, and hollow and resonant as a drum; and the lower half, which was so clear, has become so dull, that neither ear, nor stethoscope, nor percussion, can ascertain or elicit from it any sound whatever. On the left side the auscultatory Signs remain just what they were.

But, on the right side, what sudden and extraordinary change has taken place in the parts within, correspondent with the sudden and extraordinary change in the auscultatory Signs? You will see, if you wait and look a little more inquisitively into all the circumstances. And I invite your most curious attention to this instance; for it assigns a sort of triumph to Auscultation, showing, I conceive, the utmost perfection of which the diagnosis of internal disease is capable.

Where it was dull, the chest is resonant; where it was resonant, it is dull.

It is resonant, loudly resonant to *percussion* at the upper part.* Then surely there is air within. —But the ear detects no respiratory murmur. The air, therefore, must be under some peculiar conditions. Is it imprisoned within the lung in dilated vesicles, or effused from ruptured vesicles beneath the pleura? There is, indeed, the same contrast between what percussion intimates and what Auscultation, as in the case of Emphysema. But there is no Emphysema, notwithstanding. The resonance is too loud, and too uniformly clear all round the chest; and the air, wherever it is, is in too free a space for Emphysema. For the same reasons the air cannot be contained in any mere pulmonary cavity, however large. Besides, the ear not only detects no respiratory murmur, but it has lost the gurglings, the cavernous sounds, the pectoriloquy which it once heard.

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* I speak of "the upper part" of the chest *generally*; for it is probable that at its very summit the contrast will not be so marked. By the time the disease has reached the stage of vomicæ, the apex of the lung has often contracted firm adhesion to the ribs; and the air, finding its way into the pleura from an opening *below* this adhesion, cannot have the effect of rendering tympanitic that part of the chest which is *above* it.

But does the ear, by mere listening, catch no sound whatever, where the resonance to percussion is so loud? Yes! at each breath, each voice, or each cough, it catches a metallic sound, which lasts for an instant, like an echo, after the breath, the voice, or the cough has ended; and this sound is a ring or a tinkle.

But the chest is dull, absolutely dull, at the lower part. And the cause of this dulness is the effusion of fluid into the cavity. Do you doubt the fact? Then move the trunk of the body quickly to and fro; and listen the while with your ear to the thorax; and you will at each succussion hear the plashing of fluid within. Or make your patient alter his posture from the vertical to the horizontal, or *vice versâ*, and the resonance and the dulness will sometimes shift their situations.

Thus air and fluid share the cavity of the pleura between them. The air found its way thither from the Vomica, either by a direct perforation of its walls, or by a fistulous channel proceeding from it. The fluid is a secretion from the surface of the pleura itself. And the air and the fluid, thus sharing the cavity of the pleura between them, do, by the manner in which they are made to act upon each other, produce the ringing or the tinkling which accompanies the breathing, the voice, or the cough, and the plashing which attends succussion.

Observe, I have here spoken of a single instance, but I have represented a class. And if you will view it as such, and will consider, in this instance, how wonderfully Auscultation enables your knowledge to keep pace with the actual procedure of the disease, revealing its exact conditions at each particular time, and its changes from one condition to another from time to time, you must allow that the ear may sometimes be trusted not less confidently than the eye itself for a sure diagnosis. But each sense has its proper sphere. Yet, in this instance, if you could look into the chest of the living man, what more could you know than you *do* know by listening at it?

Such is the metallic sound proceeding from Pneumothorax, with all its attendant circumstances, and concurrent auscultatory Signs. It has always been, when I have met with it, a *tinkling sound;* louder or fainter, more or less prolonged into an echo, like this thing or that, but always a tinkling sound.

This metallic tinkling does not occur at any one certain period of phthisical disease. I have known it discovered for the first time a few days previous to the patient's death; and I have known it and the other accompaniments of Pneumothorax exist for six months; and in the mean time the patient's general health has improved, and he has even gained flesh. These varieties in the clinical history of different cases are just what might be expected. The conditions out of which the metallic tinkling springs, are, in a certain sense, accidental. A vomica may happen to be near the surface of the lung, and may ulcerate its way through the pleura, as well at one period in the progress of the disease as at another.

But I do not mean to limit the possibility of surviving, after Pneumothorax has taken place, to six months, or to any certain period. I recollect a patient or two, who, after they had been for some time objects of great interest, on account of the metallic tinkling and the audible plashing of fluid within the chest, suddenly left the hospital, and took care to leave us no means of tracing them. How long these men survived I cannot tell.

It is worthy of remark that Pneumothorax thus superadded to phthisis does not necessarily produce a great aggravation of the patient's distress. For he is often still able to move his body easily in bed, and even to walk about the room. In some so affected I have remarked the interest, and even the amusement, they have taken in the circumstances of their own complaint. The business of Auscultation, which to most patients, I fear, is a trouble and a distress, they submit to with alacrity twenty times a day. They hear, themselves, the plashing of fluid within the thorax. And this, which they think so strange, they are always ready to exhibit, and to shake their chests as often as they are desired, until they have satisfied the curiosity of every inquirer.

Probably the period to which the patient survives after the metallic tinkling and its concomitant symptoms have arisen, and the much or little augmentation of distress attending them, may depend upon the kind of fluid effused within the chest, and the kind of morbid process engaged in producing it.

In all the instances of Pneumothorax with the metallic tinkling, except two, with which I have been acquainted, the patient has lived several months, and the fluid found upon dissection has been the mere serum of hydrothorax. In one of the excepted instances, the metallic tinkling was not present, or at least not discovered, until within three days of the patient's death; and from that time the agony was frightful. Moreover there was this peculiarity in the auscultatory Signs, that every part of the chest, in all positions of the body, returned the loudest resonance to percussion, and gave out the clearest metallic tinkling in breathing, in speaking, and in coughing. The patient was too ill to permit succussion. The absence of its direct auscultatory Signs made us doubt whether there was any fluid in the chest. Fluid, however, was found in very small quantity; but that fluid was pus.

In the other excepted instance, the metallic tinkling was heard for eighteen days before the patient's death. It was a case of pneumonia, in which, after the severity of the inflammation was subdued, Pneumothorax arose, with metallic tinkling and, during the last few days of existence, with fetid expectoration.

If, on the left side, a line had been drawn round the chest from the sternum to the spine, on a level with the mamma, you might have heard the metallic tinkling and the loudest resonance upon percussion, every where below it, and a clear respiratory murmur every where above it.

Upon examination after death, the left lung was found adherent to the ribs in a space corresponding with the imaginary line just indicated. By this adhesion the pleura was divided into two unequal cavities. In the upper and smaller cavity no fluid was effused, and the lung was healthy. In the lower and larger there were both air and fluid, and the lung was diseased. The flui dark and fetid, and the lung was partly in the of grey and red hepatization and partly gangre In the midst of the gangrenous portion w orifice through which air found its way fro trachea into the pleural cavity.

THE END.

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